Wiring Diagrams

UNITS WITH STARTING SERIAL NUMBER 1307UXXXXX AND LATER

INDEX

TYPE	UNIT	NUMBER	FIG. NO.
Component Arrangement	48/50AJ,AK,AW,AY020-035	48EJ502489	1
	48/50AJ,AK,AW,AY036-060	48EJ503652	2
Power Schematic	48/50AJ,AK,AW,AY020-027	48EJ503085	3
	48/50AJ,AK,AW,AY030-035	48EJ503084	4
	48/50AJ,AK,AW,AY036-041	48EJ503653	5
	48/50AJ,AK,AW,AY050	48EJ503082	6
	48/50AJ,AK,AW,AY051,060	48EJ503654	7
Main Control Box Circuit	48/50AJ,AK,AW,AY020-060	48EJ503075	8
Auxiliary Control Box Wiring	48/50AJ,AK,AW,AY020-060	48EJ503076	9
Controls Expansion Board Wiring	48/50AJ,AK,AW,AY020-060	48EJ503086	10
Gas Heat Control Circuit (2-Stage Heat)	48AJ,AK,AW,AY020-050	48EJ503079	11
	48AJ,AK,AW,AY051	48EJ503679	12
	48AJ,AK,AW,AY060	48EJ503077	13
Gas Heat Control Circuit (Staged Gas Heat)	48AJ,AW020-050	48EJ502488	14
	48AJ,AW051	48EJ503680	15
	48AJ,AW060	48EJ503078	16
Electric Heat Control Circuit	50AJ,AK,AW,AY020-050	48EJ503080	17
	50AJ,AK,AW,AY051,060	48EJ503655	18

ACCESSORIES

ACCESSORY	UNIT	FIG. NO.
Motormaster® V Low Ambient Controller	48/50AJ,AK,AW,AY020-035	19
	48/50AJ,AK,AW,AY036-060	20
Space Sensor Temperature Averaging	48/50AJ,AK,AW,AY020-060	21
Thermostat, Remote Economizer Position Override, Remote Economizer Minimum Position Set Point, Remote 4 to 20 mA Economizer Position, and Space IAQ Sensor	48/50AJ,AK,AW,AY020-060	8
Outdoor Enthalpy Changeover Sensor and Differential Enthalpy Changeover Sensor	48/50AJ,AK,AW,AY020-060	9
Outdoor Air Quality Sensor, Remote Supply Air Set Point, Demand Limit Controller, Outdoor Inlet CFM Sensor, Fan Status Switch, Demand Limit-Redline, Demand Limit-Loadshed, Fire Pressurization, Fire Evacuation, Fire Smoke Purge, and IAQ Override Switch	48/50AJ,AK,AW,AY020-060	10

NOTE: Accessory wiring is shown on the unit wiring diagrams. Refer to the appropriate drawing for accessory wiring.

ELECTRIC HEAT POWER DIAGRAMS

UNIT SIZES	ELEC CHARACTERISTICS	NOMINAL kW		FIG. NO.	QTY PER UNIT
		Lo Heat	Hi Heat		
020-050	208/230-3-60	36	72	22	2
	460-3-60 380-3-60 400-3-50	36 24 27	72 49 54	22	2
	575-3-60	36	72	22	2
051,060	208/230-3-60	54	108	22	3
	460-3-60 380-3-60 400-3-50	54 37 41	108 74 82	22	3
	575-3-60	54	108	22	3

NOTE: All power leads connect to (single) TB7 power terminal block – 2 or 3 conductors per terminal.

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

LEGEND AND NOTES FOR FIG. 1-18

LEGEND

BP — Building Pressure
C — Contactor, Compressor
CAP — Capacitor
CB — Circuit Breaker
CCB — Control Circuit Breaker
CCH — Crankcase Heater
CCN — Carrier Communication Network®
CEM — Controls Expansion Module
COMP — Compressor Motor
CS — Compressor Safety
CSB — Current Sensing Board
DP — Duct Pressure
DS — Disconnect Switch
ECB — Economizer Control Board
EDT — Evaporator Discharge Temperature Sensor
FIOP — Factory-Installed Option
FS — Flame Sensor
FU — Fuse
GND — Ground
HC — Heater Contactor
HGBP — Hot Gas Bypass
HPS — High-Pressure Switch
HR — Heater Relay
HS — Hall Effect Sensor
IAQ — Indoor Air Quality
IDM — Induced Draft Motor
IFC — Indoor Fan Contactor
IFCB — Indoor Fan Circuit Breaker
IFM — Indoor Fan Motor
IGC — Integrated Gas Unit Controller
IP — Internal Protector
LAT — Leaving Air Temperature Sensor
LEN — Local Equipment Network
LS — Limit Switch
MBB — Main Base Board
MGV — Main Gas Valve
NEC — National Electrical Code
OARH — Outdoor-Air Relative Humidity
OAT — Outdoor-Air Temperature Sensor
OFC — Outdoor Fan Contactor
OFM — Outdoor Fan Motor
PEC — Power Exhaust Contactor
PEM — Power Exhaust Motor
PL — Plug Assembly
RARH — Return Air Relative Humidity
RAT — Return Air Temperature Sensor
RLA — Rated Load Amps
RS — Rollout Switch
SCB — Staged Gas Board
SCT — Saturated Condensing Temperature Sensor
SDU — Scrolling Marquee Display Unit
SST — Saturated Suction Pressure Transducer
TB — Terminal Block
TRAN — Transformer
VFD — Variable Frequency Drive

Terminal Block

Terminal (Unmarked)

Terminal (Marked)

Splice

Factory Wiring

Field Wiring

To indicate common potential only, not to represent wiring.

To indicate FIOP or Accessory

Common

PLUG LOCATION REFERENCE

NAME	LOCATION	DESCRIPTION
PL1	MAIN CB	Communications from MMB to PL5/PL4
PL2	MAIN CB	Smoke Detector & 24V from TB5 to AUX CBOX
PL3	MAIN CB	Heat Control & 24V from MBB to PL9
PL4	MAIN CB	Communications from OL1 to SCB/EMM
PL5	AUX CB	Communications from PL1 to ECB1 & ECB2
PL6	AUX CB	REM/OCC from PL7 to ECB1
PL7	MAIN CB	REM/OCC from TB5/6 to PL6/12
PL8	AUX CB	ECM Control from PL12 to ECB1
PL9	ELEC HEAT	Control from PL3 to IGC/HR/PL14
PL10	GAS HEAT	IDM Line Voltage from PL11 to IDM(CAP)
PL11	MAIN CB	Line Voltage from OFC2 to PL10 (IDM)
PL12	AUX CB	Branch from PL2,7,8 to PL13,18,19,20
PL13	AUX CB	Smoke Det. Control from PL12 to Smoke Det.
PL14	ELEC HEAT	Control Power to Heater Box 1
PL15	ELEC HEAT	Control Power to Heater Box 2
PL16	ELEC HEAT	Control/Signal from PL12 to Economizer
PL18	AUX CB	Control/Signal from PL12 to CO_2 Sensor
PL19	AUX CB	Control/Signal from PL12 to Economizer
PL20	AUX CB	24V Power from PL12 to ECB1/ECB2
PL21	AUX CB	24V Power from PL20 to ECB1/PEC
PL22	MAIN CB	Line Voltage from CCB to PEC
PL23	AUX CB	Pwr. Exh. from PEC to PL24,25,26,27
PL24	AUX CB	PEM Pwr. from PL23
PL25	AUX CB	PEM Pwr. from PL23
PL26	AUX CB	PEM Pwr. from PL23
PL27	AUX CB	PEM Pwr. from PL23
PL28	MAIN CB	Thermistor Input from MMB to PL29/PL30
PL29	EVAP SECT	SAT Harness
PL30	AUX CB	OAT/RAT Harness
PL31	MAIN CB	HPS/SST
PL33	MAIN CB	Crankcase Heaters
PL34	MAIN CB	SCT
PL35	EVAP SECT	Hot Gas Bypass Harness

NOTES:
1. Factory wiring is in accordance with the national electrical codes. Any field modifications or additions must be in compliance with all applicable codes.
2. Use 75° C min wire for field power supply, use copper wires for all units.
3. All circuit breakers “Must Trip Amps” are equal to or less than 156% RLA.
4. Compressor and fan motors are thermally protected — three phase motors protected against primary single phase conditions.
5. Red jumper wire must be added between R and WI for Space Temperature mode and temporarily during Service-Test mode when the heaters need to operate.

SEQUENCE OF OPERATION

Constant Volume (CV) Units — On power up, the control module will activate the initialization software. The initialization software will determine the unit configuration and also initialize any controls loops and input/output devices. All alarms and configurations are saved in memory and maintained during power outages. All alarms will be maintained in memory and must be cleared through the scrolling marquee display.

The unit can be configured with two different control types: thermostat control or space temperature sensor control.

THERMOSTAT CONTROL — If the unit is equipped with a thermostat with Y1, Y2, W1, W2 and G connections, then the control will perform the following sequence.

When terminal G is energized, the indoor fan will turn on. The fan must be running for heating or cooling to occur. If Y1 is closed (first stage of cooling is energized), then the unit control will first check the ability to use the economizer. If the economizer can be used, then the unit control will modulate the damper open to maintain the low-load economizer leaving air temperature set point.

If Y2 closes (second stage of cooling is energized), then the unit control will lower the leaving air temperature set point to the configured set point. If the economizer cannot satisfy the load, then the compressors will be sequenced on to maintain either the low or high load temperature set points. If the economizer cannot be used or the enable control disables the economizer, then the control will sequence the compressors based on the Y1 and Y2 signals.

If two-stage control has been selected, then the unit control will map the compressors to the Y1 and Y2 inputs (first and second stage cooling) as defined in the loading sequence. If Adaptive mode has been selected, then the control will add and remove compressor stages to maintain the high and low demand set points. If Y1 is closed (first stage of cooling energized), at least one compressor stage will be turned on.

If W1 closes (first stage of heating is energized), then the unit will be in the Heating mode. The economizer will be closed to the minimum position. If the unit is equipped with gas or electric heat, then the first stage of heat will be energized. If W2 closes, then the unit control will turn on the second stage of heat. If the unit is equipped with a staged gas heat control option, then the W1 and W2 signal will be used to control the gas heat to the configurable low and high heat load leaving air temperature set points. If the unit is equipped with gas heat, then the IGC board will control the operation of the gas heat. See the Gas Heat Unit Operation section for the IGC board sequence of operation.

SPACE TEMPERATURE SENSOR CONTROL — If space temperature operation has been selected using a T55, T56, or T58 sensor, then a wire jumper must be added between R, W1, and W2. If a remote occupancy control method has been selected, then the remote occupancy input must first be closed for the unit to go into heat, vent, or cooling modes. If the internal timeclock is used, the unit control module determines the occupancy state based on the system time schedules.

If Temperature Compensated Start is active, the unit will be controlled as in the occupied mode. The Temperature Compensated Start function will start the unit before the scheduled occupied time (as determined by prior operation) to bring the space to the set point temperature when occupied time starts. As an example, if the unoccupied set point is 60 F, the occupied set point is 72 F, and the occupied time period starts at 8:00 AM, the Temperature Compensated Start function will bring on the unit at 7:45 AM (as determined from previous operation) so the room temperature will be at 72 F when the occupied time starts.

If the unit has been configured for a pre-occupancy purge, then the control will start the unit in Vent mode prior to the occupancy time to vent the space. If an IAQ (indoor air quality) sensor is being used and the low IAQ set point is satisfied, then the occupancy Purge mode will be terminated.

The set points for heat and cooling are configurable through the scrolling marquee display.

NOTE: If a T56 sensor is being used, then the slide bar on the sensor can offset the set point by has much as 5 degrees.

If the space temperature rises above the cooling set point, then the unit will go into Cooling mode. If the economizer can be used, the control will first try to control to the Leaving Air Temperature set point. The set point will depend on the space temperature. If the temperature is above the Low Demand set point, then the Low Economizer Load Discharge Air Temperature set point will be used. If the temperature is above the High Load Space Temperature set point, then the High Load Leaving Air Temperature set point will be used. If the economizer cannot satisfy the load the compressors will be sequenced on to maintain either the low or high load temperature set points. If the economizer cannot be used or the unit control disables the economizer, then the unit control will sequence the compressors based on the low and high load space temperature variables. If two-stage control has been selected then the control will map the compressors to the low and high loads as defined in the loading sequence. If Adaptive mode has been selected then the control will add and remove compressors stages to maintain the low and high demand leaving air set points.

If the load goes below the heating space temperature set points, the Heating mode will initiate. The economizer will be closed to the minimum position and (if the unit is equipped with gas or electric heat) the first stage of heat will be energized. If the space temperature goes below the High Load Space Temperature set point then the control will turn on the second stage of heat. If the unit is equipped with a staged gas heat control option then the low load and high load demand signal will control the Leaving Air Temperature set point and will turn on heating stages to maintain the Leaving Air Temperature set points.

If the unit is configured for unoccupied free cooling, mechanical cooling, or heating and the room temperature goes above or below the unoccupied configuration set points, then the unit control will turn on free cooling, mechanical cooling, or heat as needed to return room temperature within the unoccupied set points. When in this mode, the economizer dampers will be maintained fully closed or to the minimum unoccupied ventilation set point.

Variable Air Volume Control — On power up, the control module will activate the initialization software. The initialization software will determine the unit configuration and also initialize any controls loops and input/output devices. All alarms and configurations are saved in memory and maintained during power outages. All alarms will be maintained in memory and must be cleared through the scrolling marquee display.

The unit will first determine the mode of operation. If the unit has been configured for space temperature demand then the control will determine, based on the configurable set points, if the unit should be in the Heat mode, Vent mode or Cooling mode. If the unit is configured for return air temperature control, then the unit control will start the fan and monitor the return air temperature against the configurable set point to determine if the unit should be in cooling, vent or heating mode.

If the control is connected to a ComfortID™ system, the room terminals are equipped with microprocessor controls that give commands to the base module. If linkage is active, the control module will replace local *Comfort*Link™ set points and occupancy data with linkage supplied data.

If Temperature Compensated Start is active, then the unit control will start the unit in advance of the occupied time to pre-cool or heat the space. If the unit is configured to use a pre-purge cycle, then the control will start the unit in vent mode based on a pre-start time interval. If an IAQ (indoor air quality) sensor is being used and the low IAQ control point is satisfied then the mode will be terminated. The mode terminates when the occupied period starts.

If Cooling mode is required, then the controlling set point will be the leaving evaporator air temperature set point. If an economizer is present and the changeover control allows the economizer to be used, then the control will first attempt to control the leaving evaporator air temperature using free cooling. If this cannot satisfy the load then additional compressor stages will be turned on to maintain the leaving air temperature. When both compressors and the economizer are being used, the unit control will use the economizer dampers to maintain better control of the leaving air and to prevent high compressor cycling. If the economizer cannot be used, then it will be set to the minimum vent position.

If the unit is equipped with an optional hot gas bypass valve, then the unit control will use hot gas as an additional stage of capacity. When the first stage of cooling is required, the unit control will turn on the circuit A compressor and the hot gas bypass valve. When additional cooling is called for, the unit control will turn off the hot gas bypass valve. The valve will also be used for additional freeze protection of the coils when low evaporator refrigerant temperatures are detected using the suction pressure tranducers.

The unit control will also monitor the supply duct pressure and send a 4 to 20 mA signal to the factory supplied inverter to control the speed of the fan to maintain the user-configured supply duct status pressure. If the *Comfort*Link control is on the CCN (Carrier Comfort Network®) system or a building linkage system, then the control also supports static pressure reset based on the needs of the zones.

If the unit has been enabled for occupied heat and if the space temperature sensor (SPT), return air temperature sensor (RAT), or CCN (in a building linkage system) demand requires that the unit be in Heating mode, then the unit control will energize the electric or gas heat to warm the space. In this mode, the unit control will energize the heat interlock relay (HIR). Note that for the linkage systems the interlock relay connection is not required. Once the mode is enabled, the unit control will use up to 2 stages of heat to control to the return air temperature set point. Heating will continue until the return temperature set point is satisfied. If the unit is configured for morning warm-up and the heating demand is below the set point during the first 10 minutes of operation, then the unit control will energize full heating capacity until the return air temperature set point is satisfied.

Gas Heat Unit Operation — The gas heat units incorporate 2 (3 on size 060) separate systems to provide gas heat. Each system incorporates its own induced-draft motor, Integrated Gas Control (IGC) board, 2-stage gas valve, manifold, and safeties. The systems are operated in parallel. For example, when there is a call for first stage heat, both induced-draft motors operate, both gas valves are energized, and both IGC boards initiate spark. All of the gas heating control is performed through the IGC boards (located in the heating section).

The MBB (Main Base Board) module board initiates and terminates heating operation and monitors the status of the requirements for indoor fan operation. The fan will be controlled directly by the MBB board.

When the thermostat or room sensor calls for heating, the MBB board will close heating relays and send power to W on each of the IGC boards. An LED on the IGC board will be on during normal operation. A check is made to ensure that the rollout switches and limit switches are closed and the induced-draft motors are not running. After the induced-draft motors are energized and speed is proven with the Hall Effect sensor on the motor, the ignition activation period begins. The burners will ignite within 5 seconds. When ignition occurs the IGC board will continue to monitor the condition of the rollout and limit switches, the Hall Effect sensor and the flame sensor.

If the unit is controlled through a room thermostat set for fan auto., 45 seconds after ignition occurs the indoor-fan motor will be energized and the outdoor-air dampers will open to their minimum position. If the overtemperature limit opens prior to the start of the indoor-fan blower, on the next attempt the 45-second delay will be shortened to 5 seconds less than the time from initiation of heat to when the limit tripped. Gas will not be interrupted to the burners and heating will continue. Once modified, the fan on delay will not change back to 45 seconds unless power is reset to the control.

If the unit is controlled through a room sensor, the indoor fan will operate in the occupied mode and the outdoor-air dampers will be at the minimum position. In the unoccupied mode, the indoor fan will be energized through the IGC board with a 45-second delay and the outside-air dampers will move to the minimum unoccupied set point.

When additional heat is required, the second stage MBB output relay closes and initiates power to the second stage of all main gas valves in all sections. When the demand is satisfied, MBB heat output relays will open and the gas valves close interrupting the flow of gas to the main burners.

If the call for stage 1 heat lasts less than 1 minute, the heating cycle will not terminate until 1 minute after W1 became active. If the unit is configured for intermittent fan then the indoor-fan motor will continue to operate for an additional 45 seconds then stop and the outdoor-air dampers will close. If the over temperature limit opens after the indoor motor is stopped within 10 minutes of W1 becoming inactive, on the next cycle the time will be extended by 15 seconds. The maximum delay is 3 minutes. Once modified, the fan off delay will not change back to 45 seconds unless power is reset to the control.

Indoor Air Quality — The Indoor Air Quality (IAQ) function provides a demand-based control for ventilation air quantity, by providing a modulating outside air damper position that is proportional to space CO_2 level. The ventilation damper position is varied between a minimum ventilation level (based on internal sources of contaminants and CO_2 levels other than the effect of people) and the maximum design ventilation level (determined at maximum populated status in the building). During a less-than-fully populated space period, the CO_2 level will be lower than maximum design ventilation level at full-load design condition, thus less ventilation air will be required. Reduced quantities of ventilation air will result in reduced operating costs. Space CO_2 level is monitored and compared to user-configured set points. An accessory CO_2 sensor for space (or return duct mounting) is required. The IAQ routine can be enhanced by also installing a sensor for outdoor air quality (OAQ).

During the occupied period in the absence of a demand for cooling using outside air, if CO_2 level is below the set point for the minimum ventilation level, the outside-air damper will be opened to and maintained at the minimum ventilation level damper position set point.

When the space CO_2 level exceeds set point for the minimum ventilation level condition, the *Comfort*Link™ control will begin to open the outside air damper position to admit more ventilation air and remove the additional contaminants. As the space CO_2 level approaches the set point for maximum design ventilation level condition, the outside air damper position will reach the maximum ventilation level damper position set point limit. Damper position will be modulated in a directly proportional relationship between these two CO_2 set point limits and their corresponding damper position limits.

In most applications a fixed reference value can be set for the outdoor air quality level, but the control also supports the addition of an outside air quality sensor that will then be compared to the indoor or return IAQ sensor. If an OAQ sensor is connected, the demand set point levels will be adjusted automatically as the outdoor CO_2 levels vary. Also, if the outdoor CO_2 level exceeds a user-configured maximum limit value, then outside air damper position will be limited to the minimum ventilation damper set point value. The unit control can also receive these signals through the Carrier Comfort Network® (CCN) system.

The IAQ and OAQ measurement levels are displayed by the *Comfort*Link™ control in parts per million (ppm).

INPUT/OUTPUT CHANNEL DESIGNATIONS — MAIN BASE BOARD (MBB)

POINT NAME	POINT DESCRIPTION	I/O POINT NAME	PLUG AND PIN REFERENCE	SIGNAL PIN(S)	PORT STATE
INPUTS					
GASFAN	YAC Indoor Fan relay (fan request from YAC)	DI1	J6, 3-4	4	0 = 24vac, 1= 0vac
FSD	Fire Shutdown switch input	DI2	J6, 5-6	6	0 = 24vac, 1= 0vac
G	Thermostat 'G' input/Remote Occupied	DI3	J7, 1-2	2	0 = 24vac, 1= 0vac
W2	Thermostat 'W2' input	DI4	J7, 3-4	4	0 = 24vac, 1= 0vac
W1	Thermostat 'W1' input	DI5	J7, 5-6	6	0 = 24vac, 1= 0vac
Y2	Thermostat 'Y2' input	DI6	J7, 7-8	8	0 = 24vac, 1= 0vac
Y1	Thermostat 'Y1' input	DI7	J7, 9-10	10	0 = 24vac, 1= 0vac
CSB_A1	Compressor A1 current sensor	DIG1	J9, 10-12	10=5v, 11=Vin, 12=GND	0 = 5vdc, 1 = 0vdc
CSB_A2	Compressor A2 current sensor	DIG2	J9, 7-9	7=5v, 8=Vin, 9=GND	0 = 5vdc, 1 = 0vdc
CSB_B1	Compressor B1 current sensor	DIG3	J9, 4-6	4=5v, 5=Vin, 6 =GND	0 = 5vdc, 1 = 0vdc
CSB_B2	Compressor B2 current sensor	DIG4	J9, 1-3	1=5v, 2=Vin, 3=GND	0 = 5vdc, 1 = 0vdc
DP_A/SCTA	Circuit A saturated condensing pressure/temp	AN1	J8, 21-23	21=5v, 22=Vin, 23=GND (thermistor 21-22)	(0-5vdc, thermistor, ohms)
DP_B/SCTB	Circuit B saturated condensing pressure/temp	AN2	J8, 24-26	24=5v, 25=Vin, 26=GND (thermistor 24-25)	(0-5vdc, thermistor, ohms)
SP_A/SSTA	Circuit A saturated suction pressure/temp	AN3	J8, 15-17	15=5v, 16=Vin, 17=GND (thermistor 15-16)	(0-5vdc, thermistor, ohms)
SP_B/SSTB	Circuit B saturated suction pressure/temp	AN4	J8, 18-20	18=5v, 19=Vin, 20=GND (thermistor 18-20)	(0-5vdc, thermistor, ohms)
RAT	Return air temperature	AN5	J8, 9-10	9	(thermistor, ohms)
SA_TEMP	Supply air temperature	AN6	J8, 11-12	11	(thermistor, ohms)
OAT	Outdoor air temperature	AN7	J8, 13-14	13	(thermistor, ohms)
SPT	Space temperature (T55/56)	AN8	J8, 1-2	1	(thermistor, ohms)
SPTO	Space temperature offset (T56)	AN9	J8, 3-4	3	(thermistor, ohms)
IAQ,/IAQMINOV	IAQ analog input	AN10	J8, 5-6	5	(thermistor, ohms)
FLTS	Filter Status	AN11	J8, 7-8	7	(thermistor, ohms)
OUTPUTS					
CMPB2	Compressor B2	RLY 1	J10, 20-21	20 = RLY1A (=RLY2A), 21 = RLY1B	1 = Closes RLY1A/RLY1B
CMPB1	Compressor B1	RLY 2	J10, 22-23	22 = RLY2A (=RLY1A), 23 = RLY2B	1 = Closes RLY2A/RLY2B
CMPA2	Compressor A2	RLY 3	J10, 24-25	24 = RLY3A (=RLY4A), 25 = RLY3B	1 = Closes RLY3A/RLY3B
CMPA1	Compressor A1	RLY 4	J10, 26-27	26 = RLY4A (=RLY3A), 27 = RLY4B	1 = Closes RLY4A/RLY4B
CONDFANB	Condenser fan B	RLY 5	J10, 10-11	10 = RLY5A (=RLY6A), 11 = RLY5B	1 = Closes RLY5A/RLY5B
CONDFANA	Condenser fan A	RLY 6	J10, 12-13	12 = RLY6A (=RLY5A), 13 = RLY6B	1 = Closes RLY6A/RLY6B
HS2	Heat stage 2	RLY7	J10, 14-16	14 = 15 = RLY7A, 16 = RLY7B	1 = Closes RLY7A/RLY7B
HS1	Heat stage 1	RLY 8	J10, 17-19	17 = 18 = RLY8A, 19 = RLY8B	1 = Closes RLY8A/RLY8B
HIR	Heat interlock relay	RLY 9	J10, 4-6	4 = 5 = RLY9A, 6 = RLY9B	1 = Closes RLY9A/RLY9B
SF	Supply fan	RLY 10	J10, 7-9	7 = 8 = RLY10A, 9 = RLY10B	1 = Closes RLY10A/RLY10B
ALRM	Alarm output relay	RLY 11	J10, 1-3	1 = 2 = RLY11A, 3 = RLY11B	1 = Closes RLY11A/RLY11B

INPUT/OUTPUT CHANNEL DESIGNATIONS — ECONOMIZER CONTROL BOARD (ECB1)

POINT NAME	POINT DESCRIPTION	I/O POINT NAME	PLUG AND PIN REFERENCE	SIGNAL PIN(S)	PORT STATE
INPUTS					
RMTIN	Remote occupancy	DI1	J4, 1-2	2	24VAC = 1, 0VAC = 0
ECONENBL, ECOORIDE	Economizer enable	DI2	J4, 3-4	4	24VAC = 1, 0VAC = 0
RARH	Return air relative humidity	AN1	J5, 1-3	1=24VDC, 2=0-20mA in, 3=GND	0-20mA
OARH	Outdoor air relative humidity	AN2	J5, 4-6	4=24VDC, 5=0-20mA in, 6=GND	0-20mA
OUTPUTS					
ECONOCMD	Economizer actuator (analog control)	AO1	J9, 1-2	1=0-20mA, 2=GND	0-20mA OUT
ECONOCMD	Economizer actuator (digital control)	PP/MP	J7, 1-3	1=PP/MP Data, 2=24VAC, 3=GND	Belimo PP/MP Protocol
PE_A	Power Exhaust stage A	RLY1	J8, 1-3	1 = 2 = RLY1A, 3 = RLY1B	1 = Closes RLY1A/RLY1B
PE_B	Power Exhaust stage B	RLY 2	J8, 4-6	4 =5 = RLY2A, 6 = RLY2B	1 = Closes RLY2A/RLY2B
PE_C	Power Exhaust stage C	RLY 3	J8, 7-9	7 = 8 = RLY3A, 9 = RLY3B	1 = Closes RLY3A/RLY3B
ECON_PWR	Economizer Power	RLY 6	J8, 16-18	16 = 17 = RLY6A, 18 = RLY6B	1 = Closes RLY6A/RLY6B

INPUT/OUTPUT CHANNEL DESIGNATIONS — VAV CONTROL BOARD (ECB2)

POINT NAME	POINT DESCRIPTION	I/O POINT NAME	PLUG AND PIN REFERENCE	SIGNAL PIN(S)	PORT STATE
INPUTS					
		DI1	J4, 1-2	2	24VAC = 1, 0VAC = 0
		DI2	J4, 3-4	4	24VAC = 1, 0VAC = 0
BP	Building static pressure	AN1	J5, 1-3	1=24VDC, 2=0-20mA in, 3=GND	0-20mA
SP	Supply Duct static pressure	AN2	J5, 4-6	4=24VDC, 5=0-20mA in, 6=GND	0-20mA
OUTPUTS					
SFAN_VFD	Supply Fan Inverter speed	AO1	J9, 1-2	1=0-20mA, 2=GND	0-20mA OUT
		PP/MP	J7, 1-3	1=PP/MP Data, 2=24VAC, 3=GND	Belimo PP/MP Protocol
		RLY1	J8, 1-3	1 = 2 = RLY1A, 3 = RLY1B	1 = Closes RLY1A/RLY1B
		RLY 2	J8, 4-6	4 =5 = RLY2A, 6 = RLY2B	1 = Closes RLY2A/RLY2B
		RLY 3	J8, 7-9	7 = 8 = RLY3A, 9 = RLY3B	1 = Closes RLY3A/RLY3B
MLV	Minimum load valve	RLY 6	J8, 16-18	16 = 17 = RLY6A, 18 = RLY6B	1 = Closes RLY6A/RLY6B

INPUT/OUTPUT CHANNEL DESIGNATIONS — STAGED GAS HEAT CONTROL BOARD

POINT NAME	POINT DESCRIPTION	I/O POINT NAME	PLUG AND PIN REFERENCE	SIGNAL PIN(S)	PORT STATE
INPUTS					
		AN1	J5, 1-3	1=5v, 2=Vin, 3=GND (thermistor 1-2)	(0-5VDC, thermistor, ohms)
		AN2	J5, 4-6	4=5v, 5=Vin, 6=GND (thermistor 4-5)	(0-5VDC, thermistor, ohms)
LAT1SGAS	Leaving air temperature 1	AN3	J5, 7-9	7=5v, 8=Vin, 9=GND (thermistor 7-8)	(0-5VDC, thermistor, ohms)
LAT2SGAS	Leaving air temperature 2	AN4	J5, 10-12	10=5v, 11=Vin, 12=GND (thermistor 10-11)	(0-5VDC, thermistor, ohms)
LAT3SGAS	Leaving air temperature 3	AN5	J5, 13-15	13=5v, 14=Vin, 15=GND (thermistor 13-14)	(0-5VDC, thermistor, ohms)
		AN6	J6, 1-3	1=5v, 2=Vin, 3=GND (thermistor 1-2)	(0-5VDC, thermistor, ohms)
		AN7	J6, 4-6	4=5v, 5=Vin, 6=GND (thermistor 4-5)	(0-5VDC, thermistor, ohms)
		AN8	J6, 7-9	7=5v, 8=Vin, 9=GND (thermistor 7-8)	(0-5VDC, thermistor, ohms)
		AN9	J7, 1-2	1	(thermistor, ohms)
		AN10	J7, 3-4	3	(thermistor, ohms)
OUTPUTS					
		AO1	J8, 1-2	1=0-20mA, 2=GND	0-20mA OUT
		AO2	J8, 3-4	3=0-20mA, 4=GND	0-20mA OUT
HS3	Heat Stage 3	RLY1	J9, 1-3	1 = 2 = RLY1A, 3 = RLY1B	1 = Closes RLY1A/RLY1B
HS4	Heat Stage 4	RLY 2	J9, 4-6	4 =5 = RLY2A, 6 = RLY2B	1 = Closes RLY2A/RLY2B
HS5	Heat Stage 5	RLY 3	J9, 7-9	7 = 8 = RLY3A, 9 = RLY3B	1 = Closes RLY3A/RLY3B
HS6	Heat Stage 6	RLY 4	J9, 10-12	10 = 11 = RLY4A, 12 = RLY4B	1 = Closes RLY4A/RLY4B
		RLY 5	J9, 13-15	13 = 14 = RLY5A, 15 = RLY5B	1 = Closes RLY5A/RLY5B

INPUT/OUTPUT CHANNEL DESIGNATIONS — CONTROLS EXPANSION BOARD

POINT NAME	POINT DESCRIPTION	I/O POINT NAME	PLUG AND PIN REFERENCE	SIGNAL PIN(S)	PORT STATE
INPUTS					
SFS	Supply Fan Status switch	DI 1	J7, 1-2	2	0 = 24vac, 1= 0vac
DMD_SW1	Demand Limit - SW1	DI 2	J7, 3-4	4	0 = 24vac, 1= 0vac
DMD_SW2/DHDISCIN	Demand Limit - Load Shed/Dehumidification Switch Input	DI 3	J7, 5-6	6	0 = 24vac, 1= 0vac
PRES	Pressurization - SW2	DI 4	J7, 7-8	8	0 = 24vac, 1= 0vac
EVAC	Evacuation	DI 5	J7, 9-10	10	0 = 24vac, 1= 0vac
PURG	Purge	DI 6	J7, 11-12	12	0 = 24vac, 1= 0vac
IAQIN	Indoor Air Quality Switch	DI 7	J7, 13-14	14	0 = 24vac, 1= 0vac
		AN7	J6, 1-3	2 (1 = loop power)	(0-20mA input)
DMDLMTMA	4-20mA Demand Limit	AN8	J6, 4-6	5 (4 = loop power)	(0-20mA input)
EDTRESMA	4-20mA Evaporator Discharge SP Reset	AN9	J6, 7-9	8 (7 = loop power)	(0-20mA input)
OAQ	Outside Air CO_2 Sensor	AN10	J6, 10-12	11 (10 = loop power)	(0-20mA input)
SPRESET	SP Reset milliamps	AN10	J6, 10-12	11 (10 = loop power)	(0-20mA input)
CEM_10K1/CEM_4201	CEM AN1 10k temp J5,1-2/CEM AN1 4-20 ma J5,1-2	AN1	J5, 1-2	1	(thermistor, ohms)
CEM_10K2/CEM_4202	CEM AN2 10k temp J5,3-4/CEM AN2 4-20 ma J5,3-4	AN2	J5, 3-4	3	(thermistor, ohms)
CEM_10K3/CEM_4203	CEM AN3 10k temp J5,5-6/CEM AN3 4-20 ma J5,5-6	AN3	J5, 5-6	5	(thermistor, ohms)
CEM_10K4/CEM_4204	CEM AN4 10k temp J5,7-8/CEM AN4 4-20 ma J5,7-8	AN4	J5, 7-8	7	(thermistor, ohms)
		AN5	J5, 9-10	9	(thermistor, ohms)
		AN6	J5, 11-12	11	(thermistor, ohms)

INPUT/OUTPUT CHANNEL DESIGNATIONS — FIELD CONNECTION TERMINAL STRIPS

TERMINAL BOARD	TERMINAL NO.	DESCRIPTION	TYPE
TB-1 - POWER CONNECTION OR DISCONNECT (in Main Control Box)			
TB1	11	L1 power supply	208-230/460/575/380/-3-60, 400-3-50
	12	L2 power supply	208-230/460/575/380/-3-60, 400-3-50
	13	L3 power supply	208-230/460/575/380/-3-60, 400-3-50
TB-2 - GROUND (in Main Control Box)			
TB2	1	Neutral Power	
TB-3 - CCN COMMUNICATIONS (HY84HA096) (in Main Control Box)			
TB3	1	LEN +	5 VDC, logic
	2	LEN C	5 VDC, logic
	3	LEN –	5 VDC, logic
	4	24 VAC	24 VAC
	5	CCN +	5 VDC, logic
	6	CCN c	5 VDC, logic
	7	CCN –	5 VDC, logic
	8	Grd	ground
TB-4 - THEROMSTAT CONNECTIONS (HY84HA090) (in Main Control Box)			
TB4	1	Thermostat R	24 VAC Power
	2	Thermostat Y1	24 VAC Input
	3	Thermostat Y2	24 VAC Input
	4	Thermostat W1	24 VAC Input
	5	Thermostat W2	24 VAC Input
	6	Thermostat G	24 VAC Input
	7	Thermostat C	24 VAC Common
	8	Thermostat X (Alarm Contact)	24 VAC Output
TB-5 - FIELD CONNECTIONS (HY84HA101) (in Main Control Box)			
TB5	1	VAV Heater Interlock Relay	Dry Contact, Max 1 Amp
	2	VAV Heater Interlock Relay	Dry Contact, Max 1 Amp
	3	10 K Thermistor	Thermistor Input
	4	Ground	Thermistor Input
	5	100,000 Ohm Set Point Pot	Thermistor Input
	6	Indoor Air IAQ Remote Sensor/Remote Pot/Remote 4-20 mA	4-20 mA, ext. powered w/res or 0-5 VDC, +
	7	Indoor Air IAQ Remote Sensor/Remote Pot/Remote 4-20 mA	4-20 mA, ext. powered w/res or 0-5 VDC, –
	8	Smoke Detector Remote Alarm	external contacts
	9	Smoke Detector Remote Alarm	external contacts
	10	Fire Shutdown	24 VAC Power
	11	Fire Shutdown	24 VAC Input
	12	Fire Control Common*	24 VAC Power
	13	Fire Pressurization*	24 VAC Input
	14	Fire Evacuation*	24 VAC Input
	15	Fire Smoke Purge*	24 VAC Input
	16	Not Used	—
TB-6 - FIELD CONNECTIONS (HY84HA101) (in Main Control Box)			
TB6	1	Remote Occupied/Economizer Enable 24 VAC	24 VAC Power
	2	Remote Economizer Contact	24 VAC Input
	3	Remote Occupied Contact	24 VAC Input
	4	Demand Limit Contacts Common*	24 VAC Power
	5	Demand Limit SW1*	24 VAC Input
	6	Demand Limit SW2 / Dehumidification Switch*	24 VAC Input
	7	Demand Limit 4-20 mA*	externally powered 4-20 mA
	8	Demand Limit 4-20 mA*	externally powered 4-20 mA
	9	Remote Supply Air Setpoint 4-20 mA*	externally powered 4-20 mA
	10	Remote Supply Air Setpoint 4-20 mA*	externally powered 4-20 mA
	11	Outdoor Air IAQ 4-20 mA*	externally powered 4-20 mA
	12	Outdoor Air IAQ 4-20 mA*	externally powered 4-20 mA
	13	IAQ Remote Switch*	24 VAC Power
	14	IAQ Remote Switch*	24 VAC Input
	15	Supply Fan Status Switch*	24 VAC Power
	16	Supply Fan Status Switch*	24 VAC Input
TB-7 - ELECTRIC HEAT POWER BLOCK (in Electric Heat section)			
TB7	1	L1 Power Supply	208-230/460/575/380/-3-60, 400-3-50
	2	L2 Power Supply	208-230/460/575/380/-3-60, 400-3-50
	3	L3 Power Supply	208-230/460/575/380/-3-60, 400-3-50

* This input is available only if accessory/optional CEM is installed.

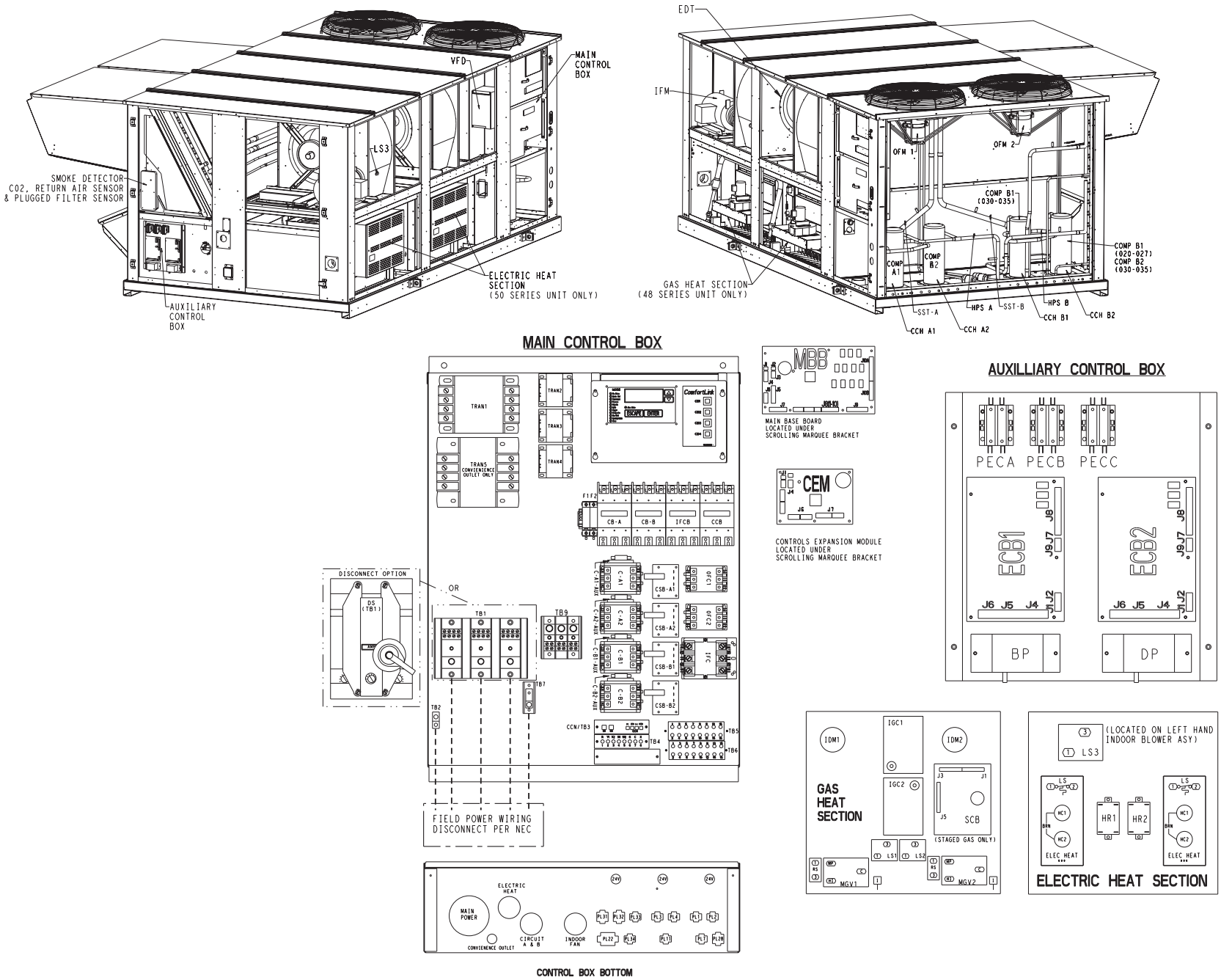
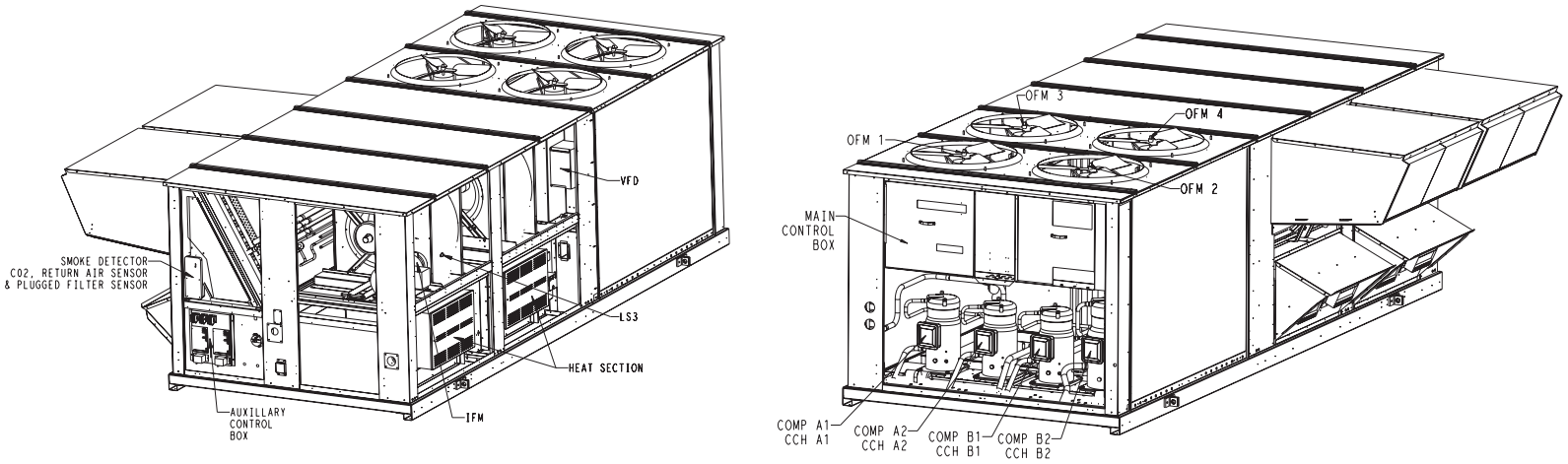


Fig. 1 — Component Arrangement — 48/50AJ,AK,AW,AY020-035 Units



LOCATIONS ARE TYPICAL FOR ALL SIZE 036-060 UNITS. SIZE 060 UNITS HAVE 6 (SIX) OUTDOOR FAN ASSEMBLIES. UNIT SHOWN IS A 50 SERIES SIZE 036.

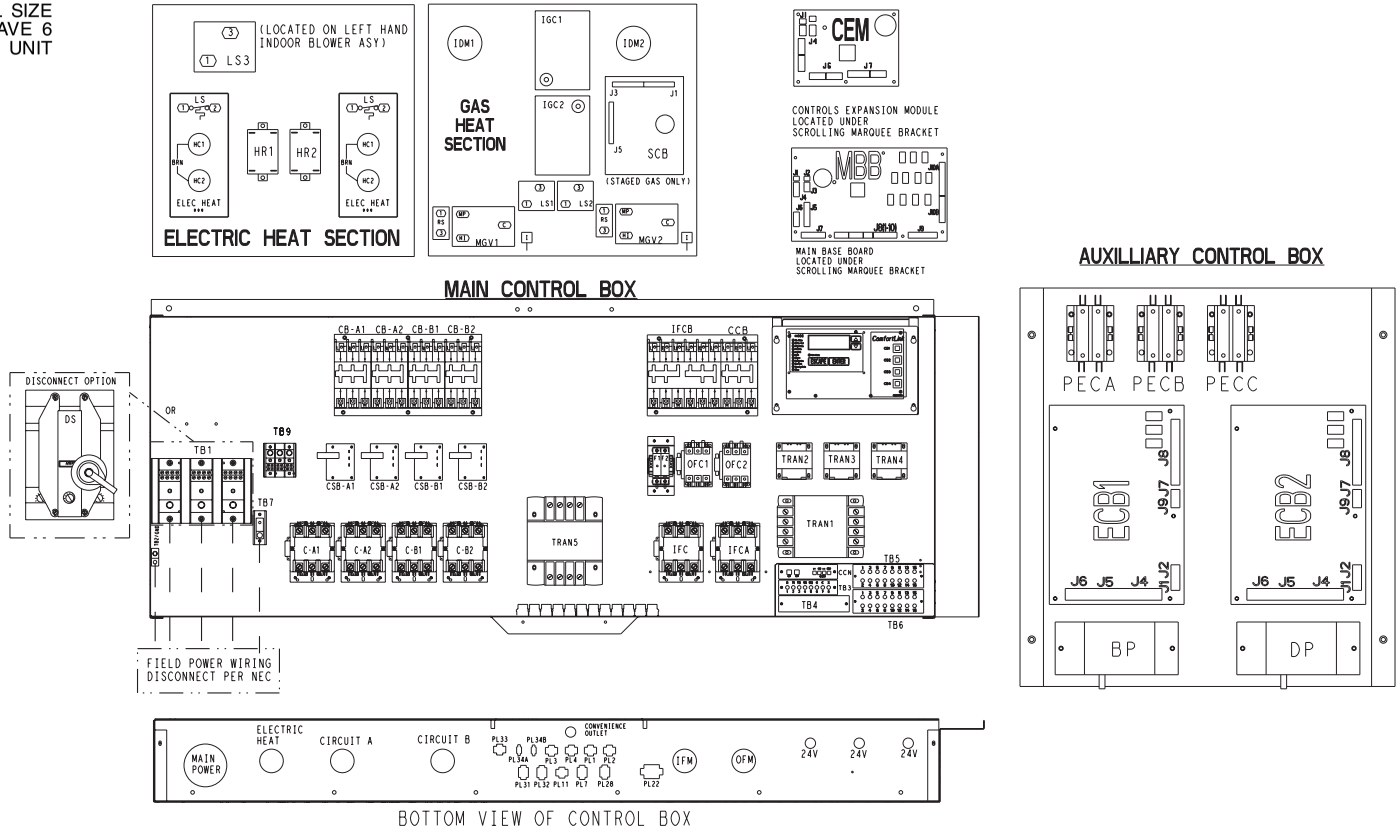


Fig. 2 — Component Arrangement — 48/50AJ,AK,AW,AY036-060 Units

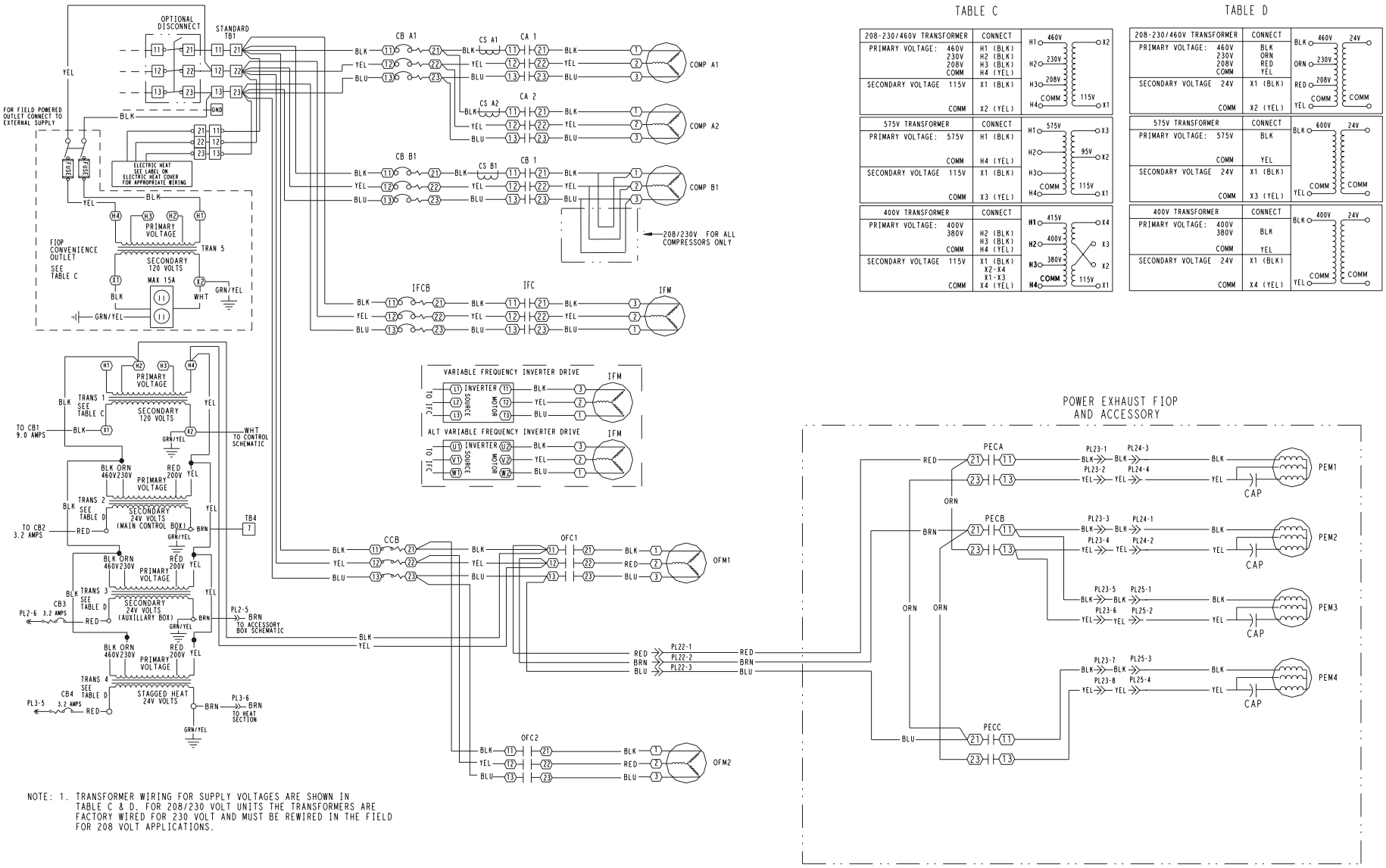


TABLE C

208-230/460V TRANSFORMER	CONNECT
PRIMARY VOLTAGE: 460V	H1 (BLK)
230V	H2 (BLK)
208V	H3 (BLK)
COMM	H4 (YEL)
SECONDARY VOLTAGE 115V	X1 (BLK)
COMM	X2 (YEL)

575V TRANSFORMER	CONNECT
PRIMARY VOLTAGE: 575V	H1 (BLK)
COMM	H4 (YEL)
SECONDARY VOLTAGE 115V	X1 (BLK)
COMM	X3 (YEL)

400V TRANSFORMER	CONNECT
PRIMARY VOLTAGE: 400V	
380V	H2 (BLK)
	H3 (BLK)
COMM	H4 (YEL)
SECONDARY VOLTAGE 115V	X1 (BLK)
	X2-X4
	X1-X3
COMM	X4 (YEL)

TABLE D

208-230/460V TRANSFORMER	CONNECT
PRIMARY VOLTAGE: 460V	BLK
230V	ORN
208V	RED
COMM	YEL
SECONDARY VOLTAGE 24V	X1 (BLK)
COMM	X2 (YEL)

575V TRANSFORMER	CONNECT
PRIMARY VOLTAGE: 575V	BLK
COMM	YEL
SECONDARY VOLTAGE 24V	X1 (BLK)
COMM	X3 (YEL)

400V TRANSFORMER	CONNECT
PRIMARY VOLTAGE: 400V	
380V	BLK
COMM	YEL
SECONDARY VOLTAGE 24V	X1 (BLK)
COMM	X4 (YEL)

NOTE: 1. TRANSFORMER WIRING FOR SUPPLY VOLTAGES ARE SHOWN IN TABLE C & D. FOR 208/230 VOLT UNITS THE TRANSFORMERS ARE FACTORY WIRED FOR 230 VOLT AND MUST BE REWIRED IN THE FIELD FOR 208 VOLT APPLICATIONS.

Fig. 3 — Power Schematic — 48/50AJ,AK,AW,AY020-027 Units

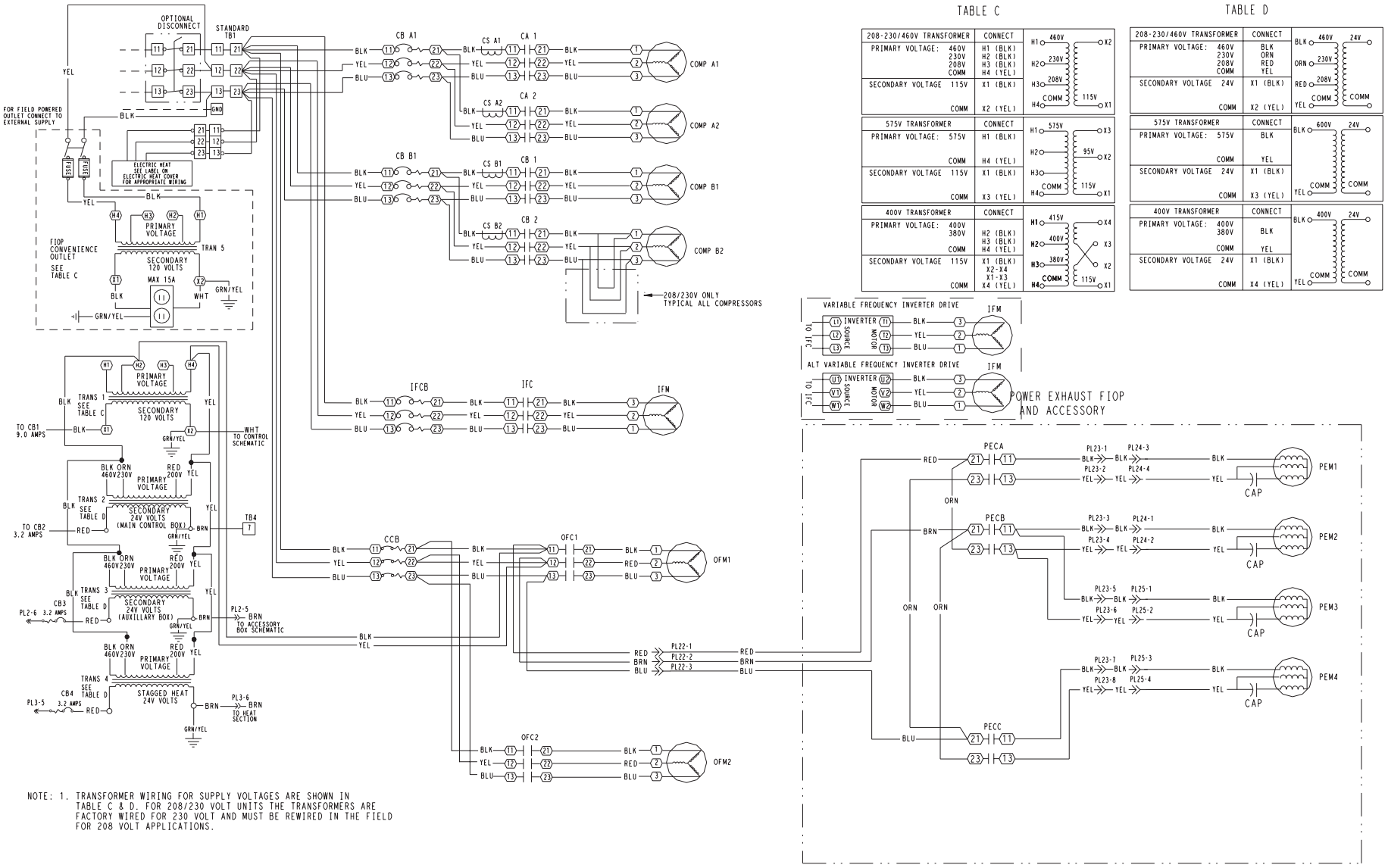
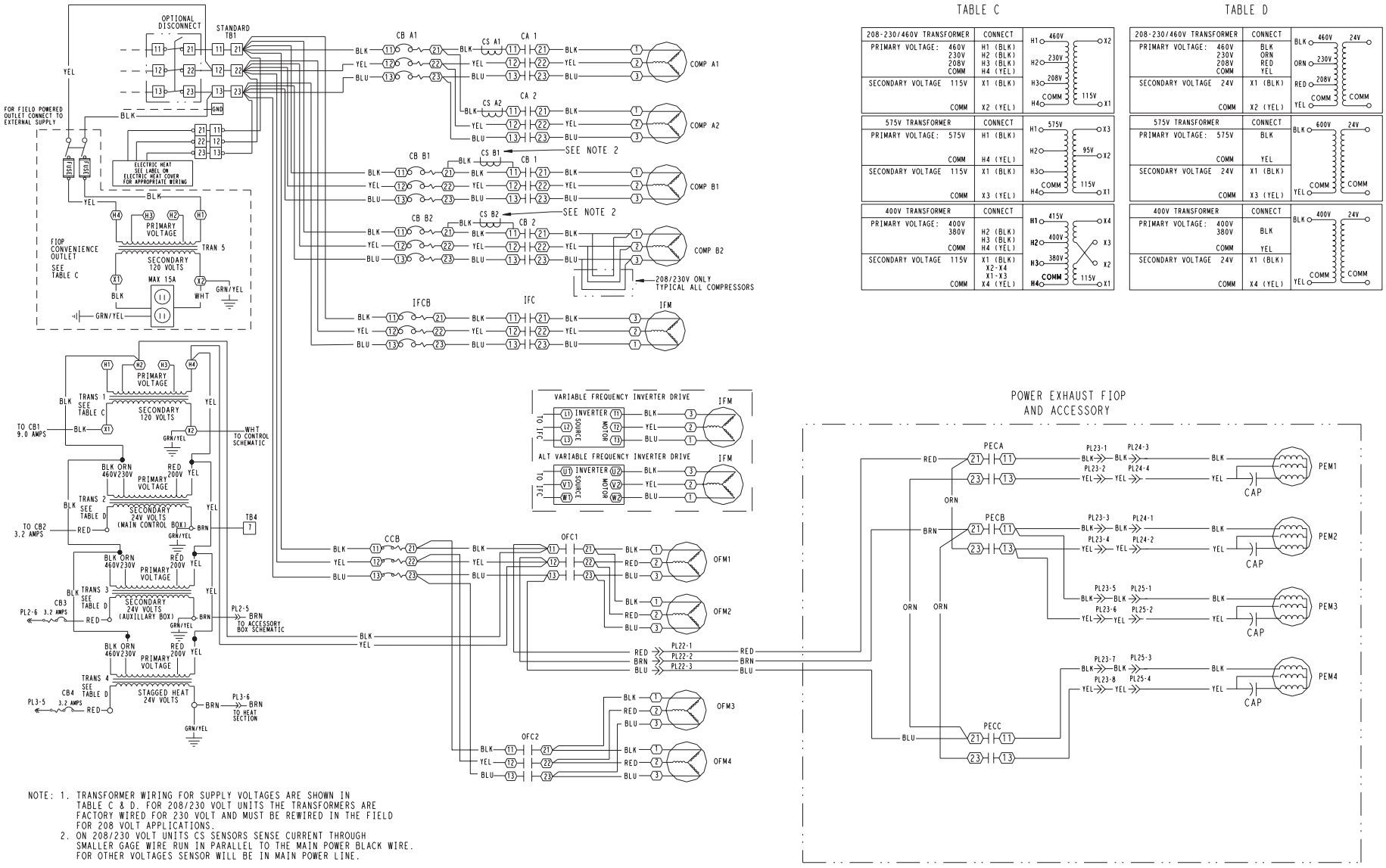
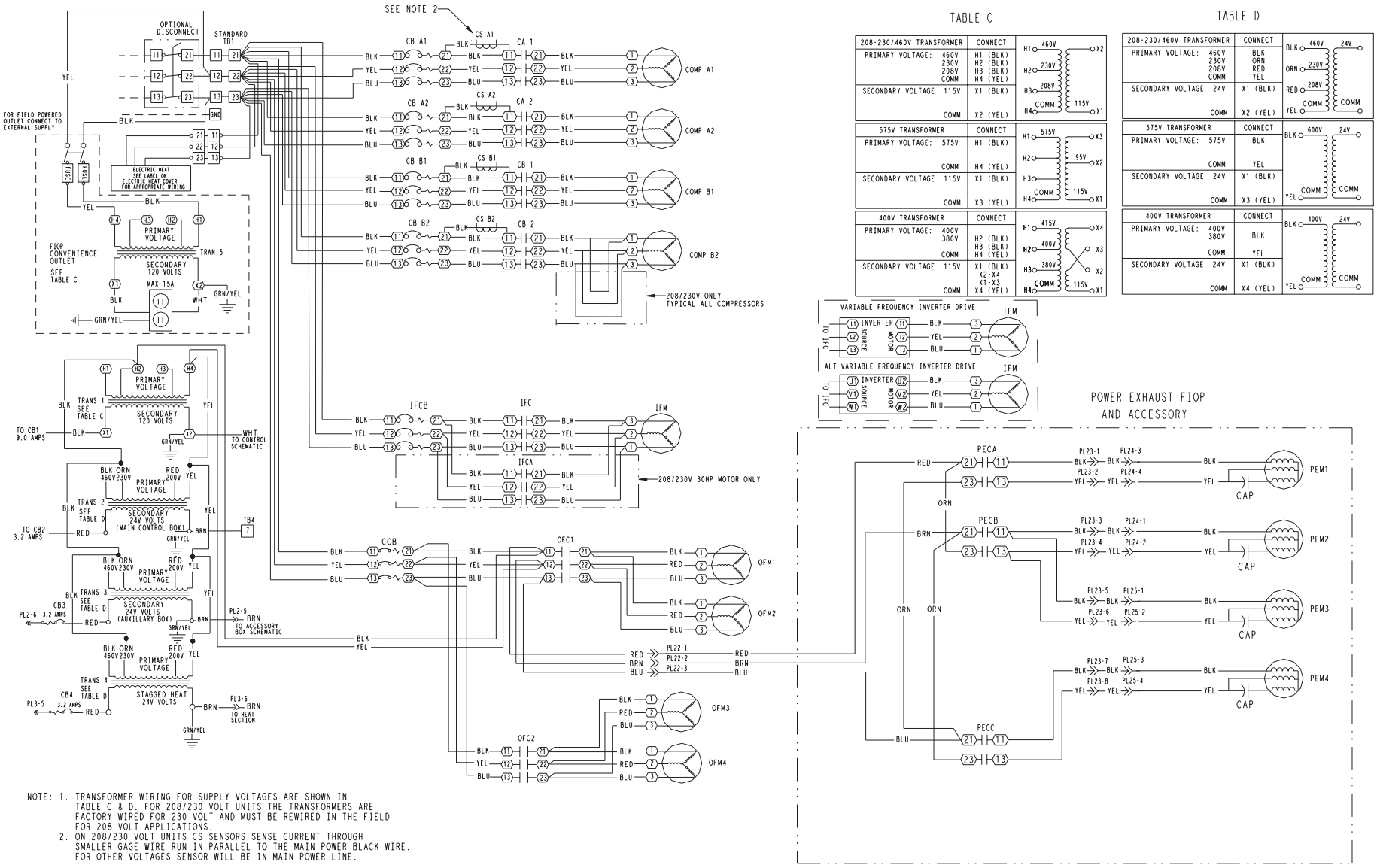


Fig. 4 — Power Schematic — 48/50AJ,AK,AW,AY030-035 Units



NOTE: 1. TRANSFORMER WIRING FOR SUPPLY VOLTAGES ARE SHOWN IN TABLE C & D. FOR 208/230 VOLT UNITS THE TRANSFORMERS ARE FACTORY WIRED FOR 230 VOLT AND MUST BE REWIRED IN THE FIELD FOR 208 VOLT APPLICATIONS.
2. ON 208/230 VOLT UNITS CS SENSORS SENSE CURRENT THROUGH SMALLER GAGE WIRE RUN IN PARALLEL TO THE MAIN POWER BLACK WIRE. FOR OTHER VOLTAGES SENSOR WILL BE IN MAIN POWER LINE.

Fig. 5 — Power Schematic — 48/50AJ,AK,AW,AY036-041 Units



NOTE: 1. TRANSFORMER WIRING FOR SUPPLY VOLTAGES ARE SHOWN IN TABLE C & D. FOR 208/230 VOLT UNITS THE TRANSFORMERS ARE FACTORY WIRED FOR 230 VOLT AND MUST BE REWIRED IN THE FIELD FOR 208 VOLT APPLICATIONS.
2. ON 208/230 VOLT UNITS CS SENSORS SENSE CURRENT THROUGH SMALLER GAGE WIRE RUN IN PARALLEL TO THE MAIN POWER BLACK WIRE. FOR OTHER VOLTAGES SENSOR WILL BE IN MAIN POWER LINE.

Fig. 6 — Power Schematic — 48/50AJ,AK,AW,AY050 Units

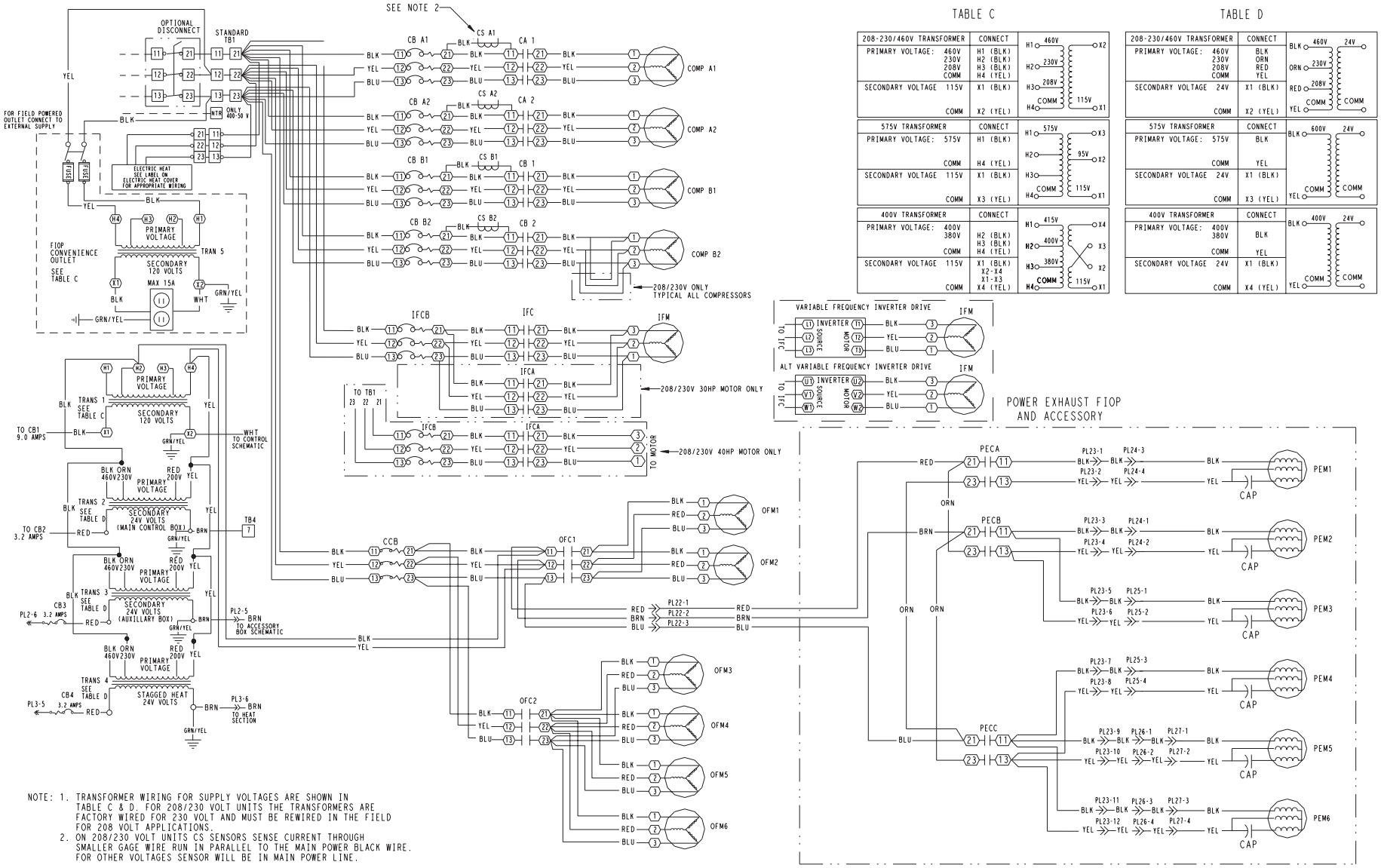


Fig. 7 — Power Schematic — 48/50AJ,AK,AW,AY051 and 060 Units

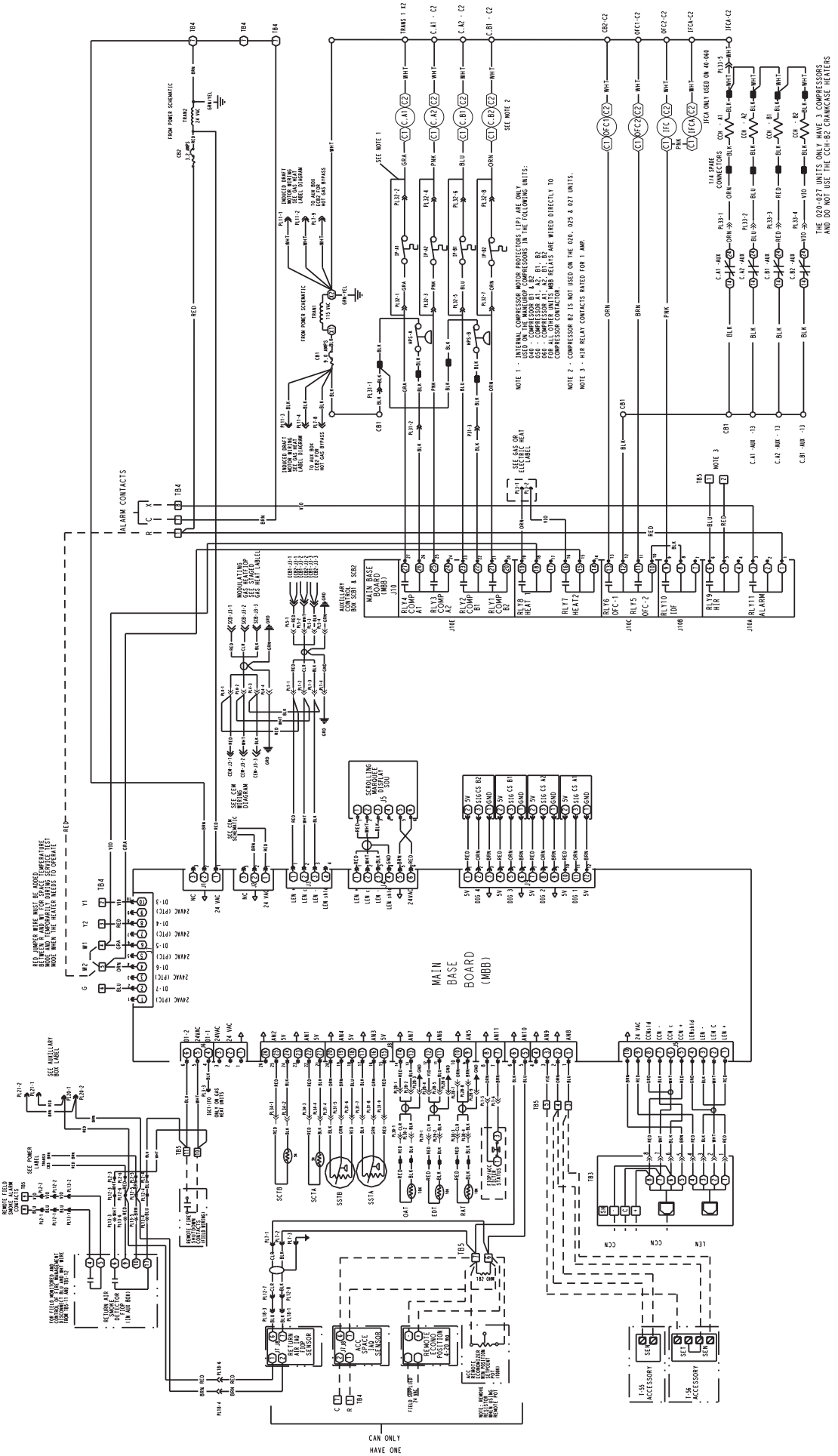

MAIN BASE BOARD (MBB)
ALARM CONTACTS
NOTE 1 - INTERNAL COMPRESSOR MOTOR PROTECTORS (IPT) ARE ONLY USED ON THE FOLLOWING UNITS:
040 - COMPRESSOR B1 & B2
050 - COMPRESSOR A1, A2, B1, B2
060 - COMPRESSOR A1, A2, B1, B2
FOR ALL OTHER UNITS MBB RELAYS ARE WIRED DIRECTLY TO COMPRESSOR CONTACTOR.
NOTE 2 - COMPRESSOR B2 IS NOT USED ON THE 020, 025 & 027 UNITS.
NOTE 3 - HIR RELAY CONTACTS RATED FOR 1 AMP.
THE 020-027 UNITS ONLY HAVE 3 COMPRESSORS AND DO NOT USE THE CCH-B2 CRANKCASE HEATERS
CAN ONLY HAVE ONE

Fig. 8 — Main Control Box Circuit — 48/50AJ,AK,AW,AY020-060 Units

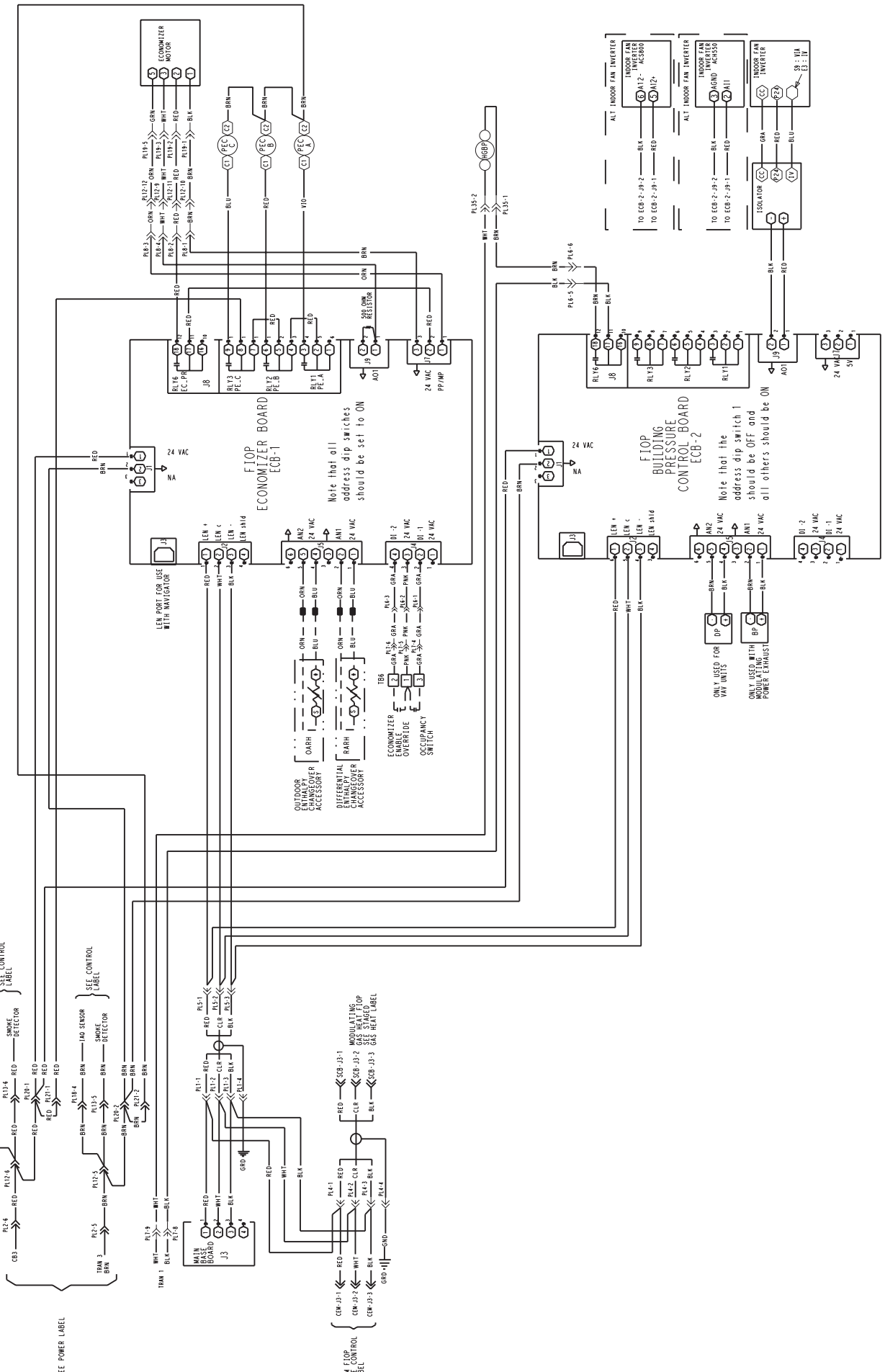

FIOP ECONOMIZER BOARD ECB-1
Note that all address dip switches should be set to ON
FIOP BUILDING PRESSURE CONTROL BOARD ECB-2
Note that the address dip switch 1 should be OFF and all others should be ON
ECONOMIZER MOTOR
24 VAC
NA
LEN PORT FOR USE WITH NAVIGATOR
OUTDOOR AIR ENTHALPY CHANGEOVER ACCESSORY
DIFFERENTIAL ENTHALPY CHANGEOVER ACCESSORY
ECONOMIZER ENABLE/ OVERRIDE
OCCUPANCY SWITCH
500 OHM RESISTOR
24 VAC PP/MP
ONLY USED FOR VAV UNITS
ONLY USED WITH MODULATING POWER EXHAUST
ALT INDOOR FAN INVERTER
TO ECB-2 J9-2
TO ECB-2 J9-1
ISOLATOR
SEE POWER LABEL
SEE CONTROL LABEL
MAIN BASE BOARD J3
MODULATING GAS HEAT FIOP SEE STAGED GAS HEAT LABEL
CEM FIOP SEE CONTROL LABEL

Fig. 9 — Auxiliary Control Box Wiring — 48/50AJ,AK,AW,AY020-060 Units

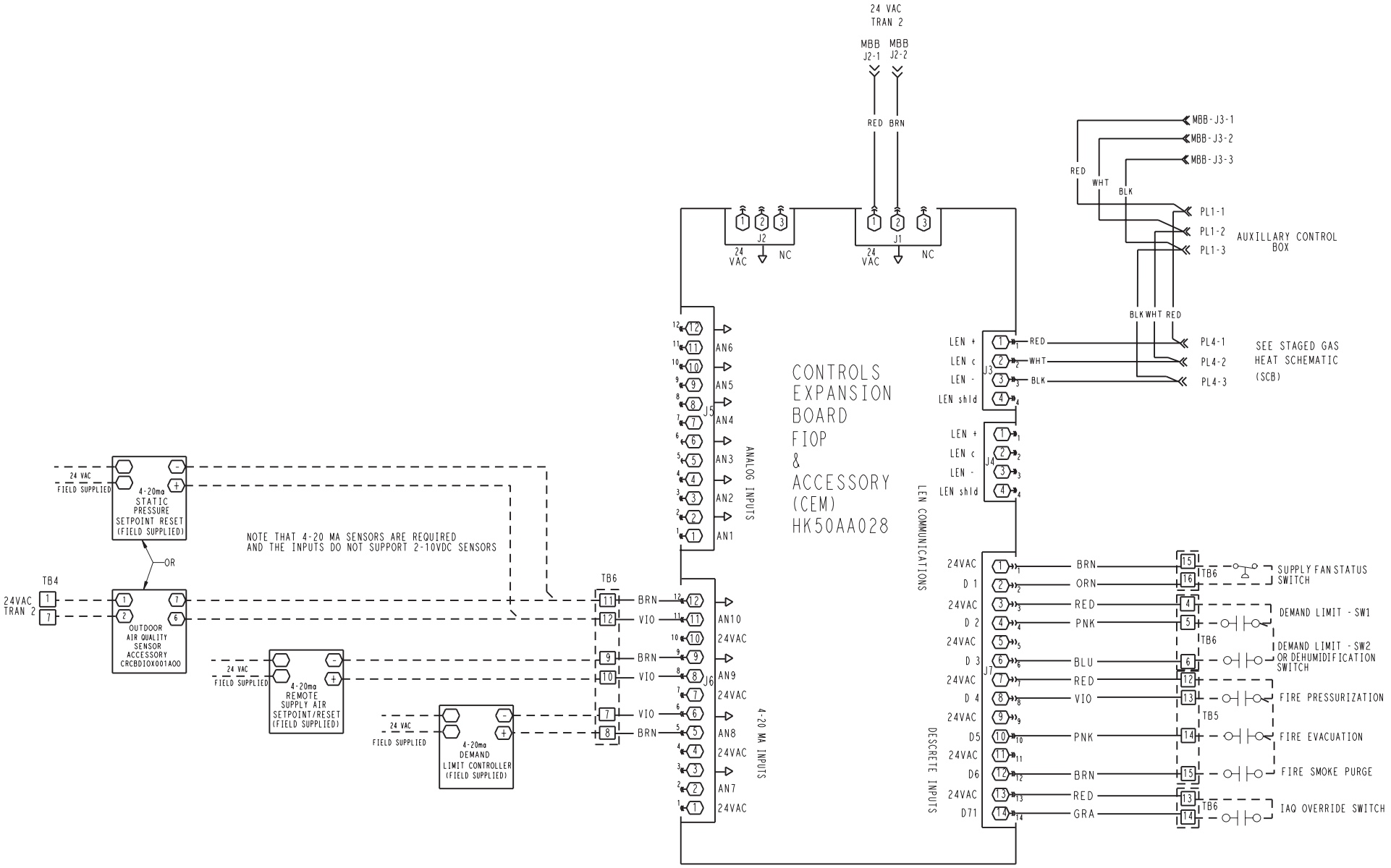


Fig. 10 — Controls Expansion Board Wiring — 48/50AJ,AK,AW,AY020-060 Units

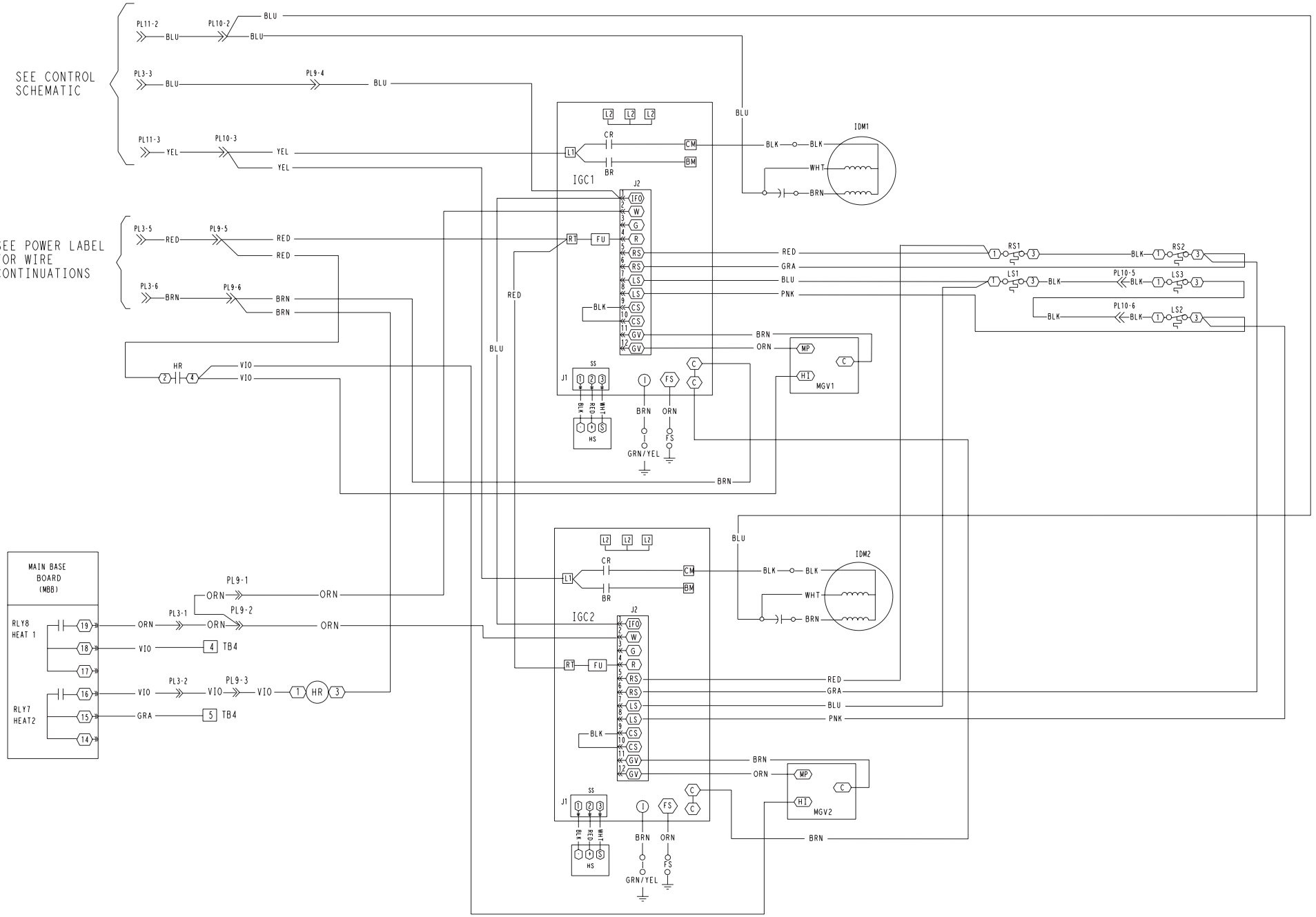


Fig. 11 — Gas Heat Control Circuit (2-Stage Heat) — 48AJ,AK,AW,AY020-050 Units

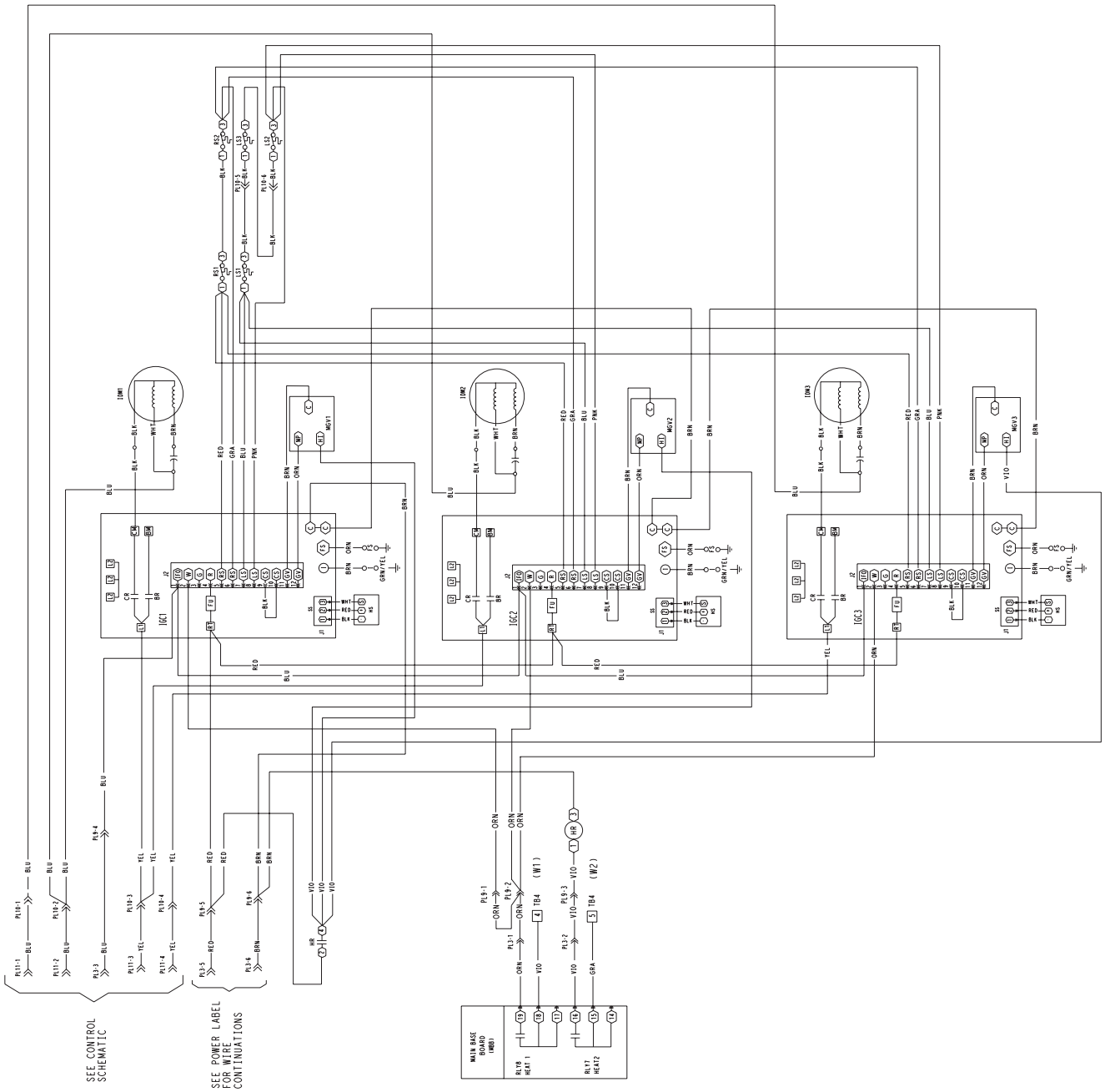


Fig. 12 — Gas Heat Control Circuit (2-Stage Heat) — 48AJ,AK,AW,AY051 Units

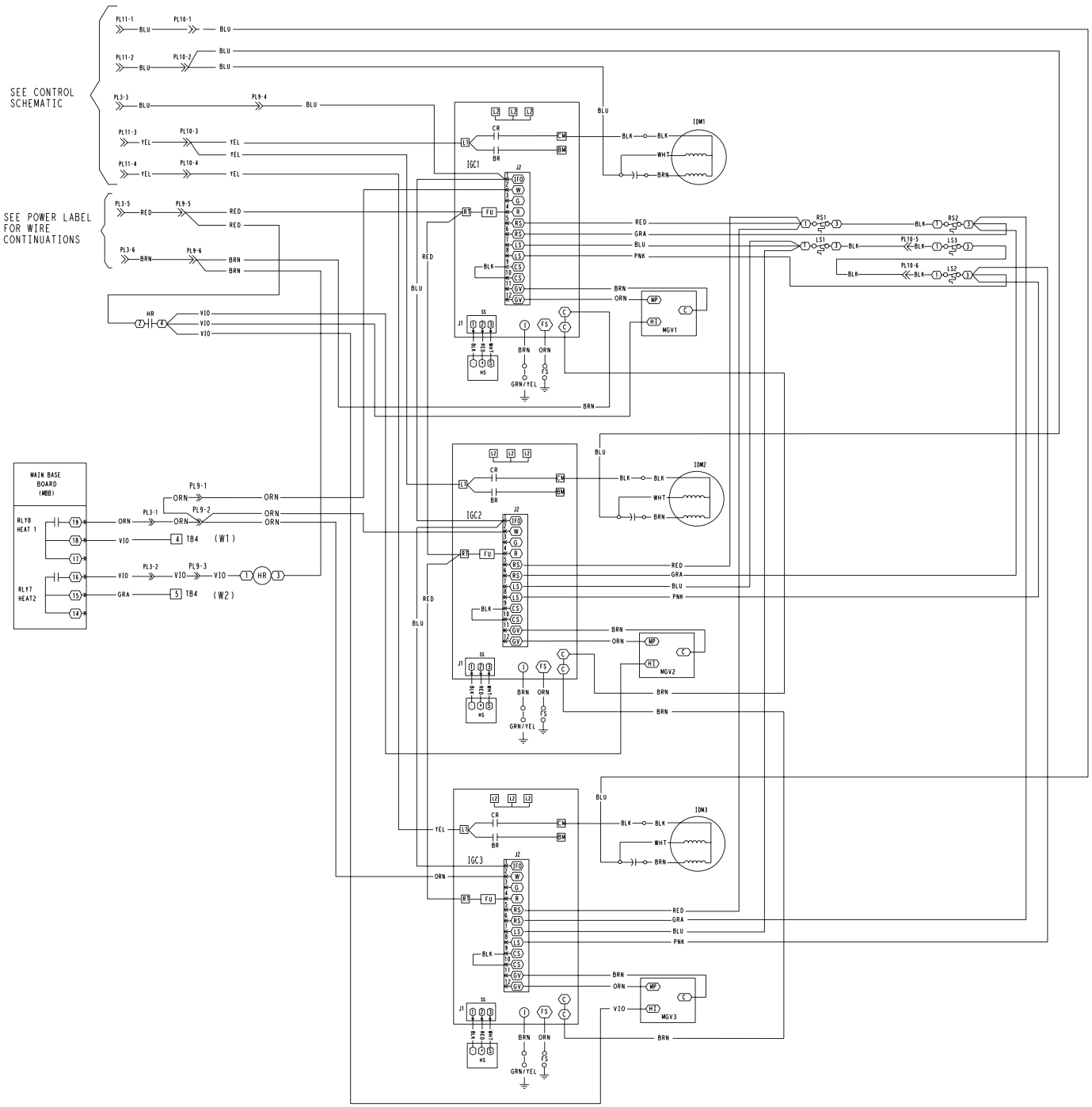


Fig. 13 — Gas Heat Control Circuit (2-Stage Heat) — 48AJ,AK,AW,AY060 Units

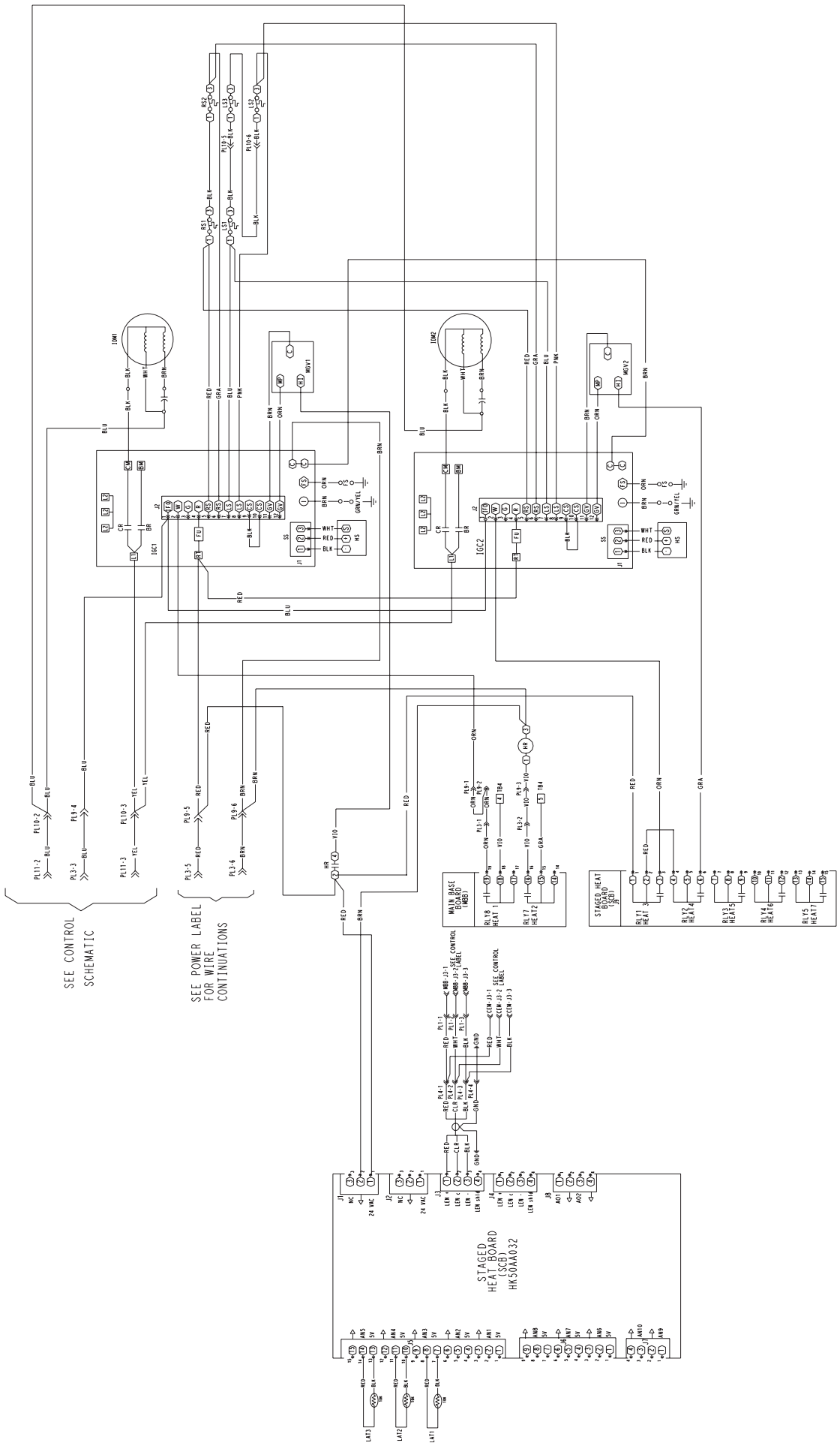


Fig. 14 — Gas Heat Control Circuit (Staged Gas Heat) — 48AJ,AK,AW,AY020-050 Units

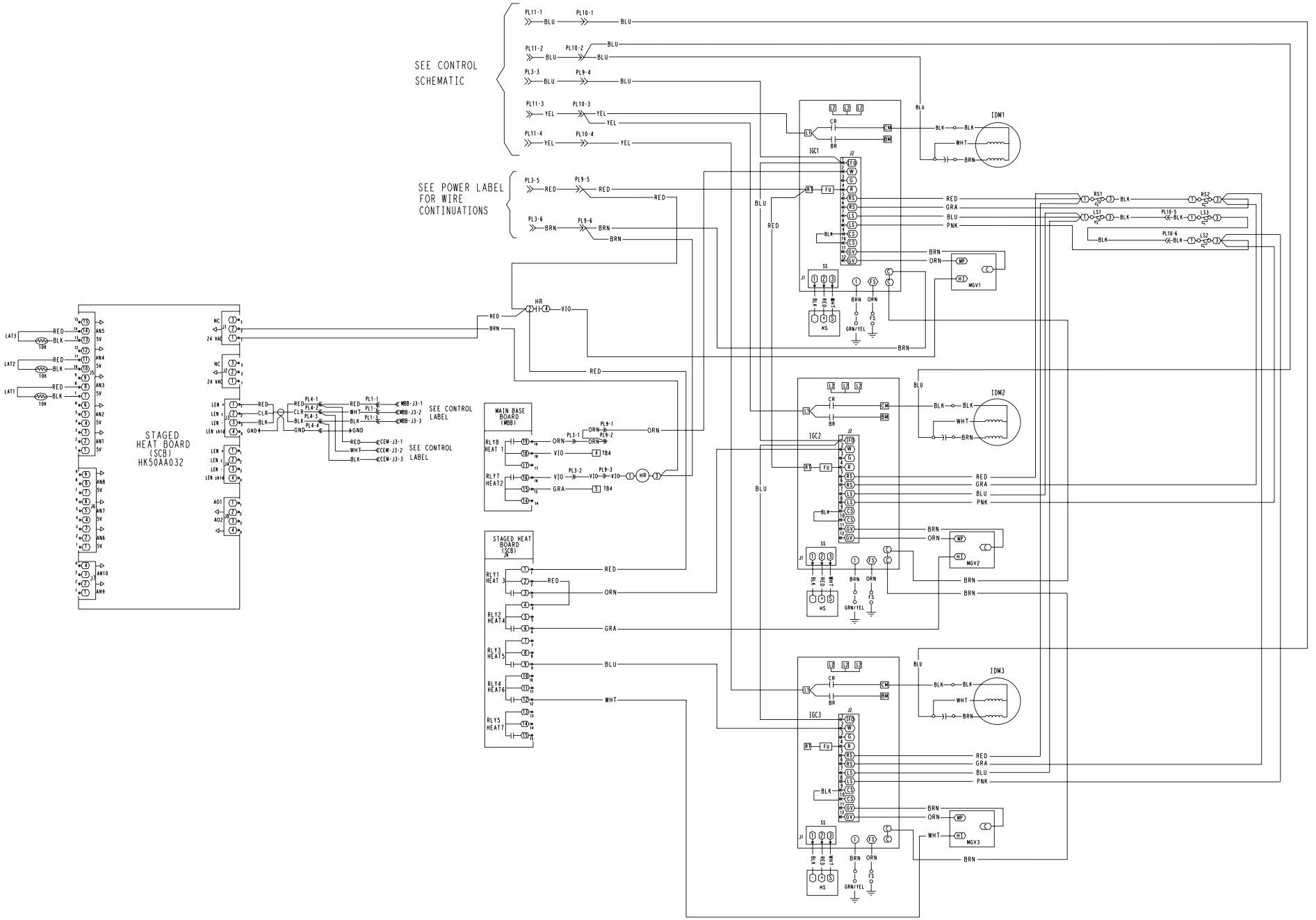


Fig. 15 — Gas Heat Control Circuit (Staged Gas Heat) — 48AJ,AK,AW,AY051 Units

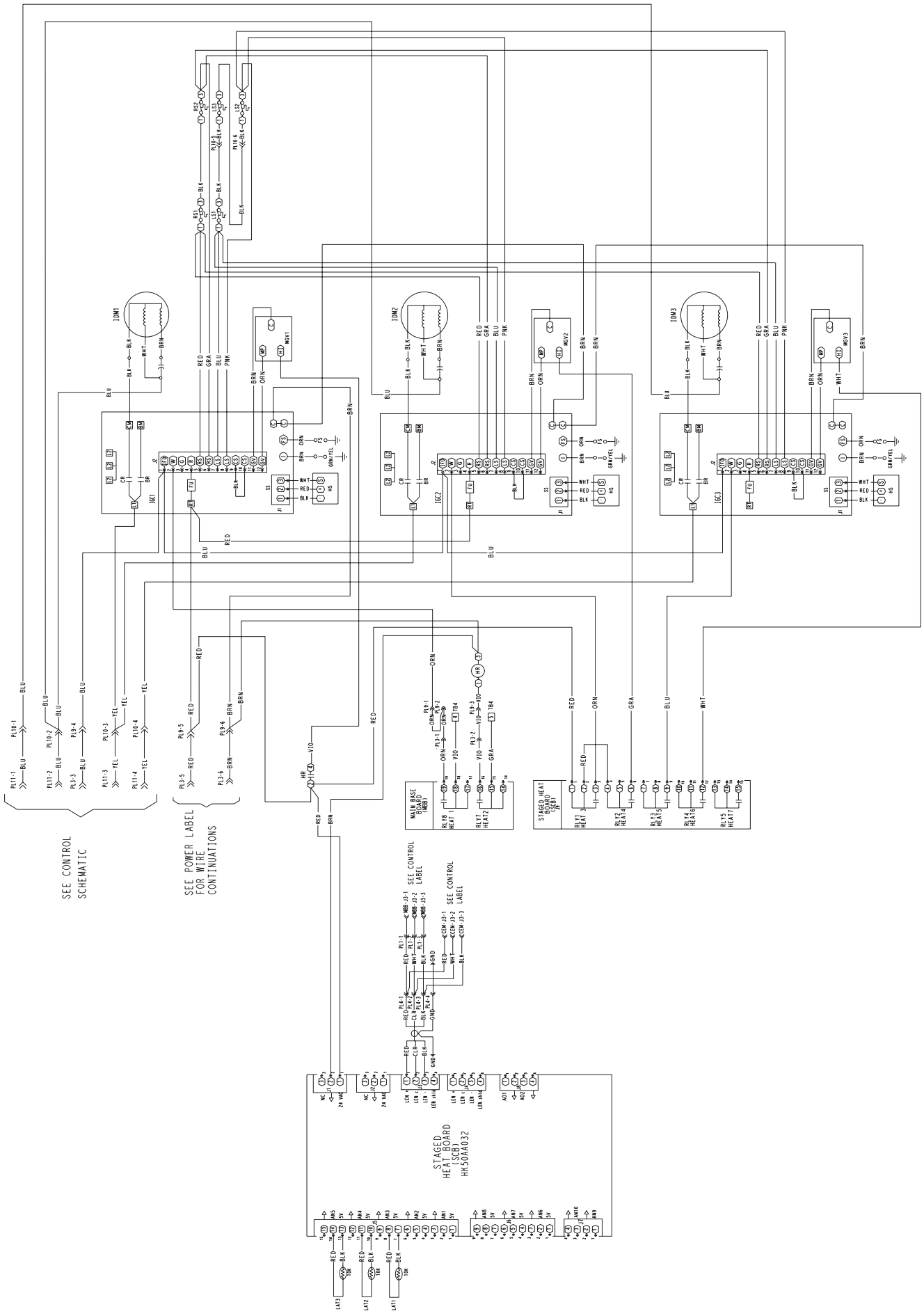


Fig. 16 — Gas Heat Control Circuit (Staged Gas Heat) — 48AJ,AK,AW,AY060 Units

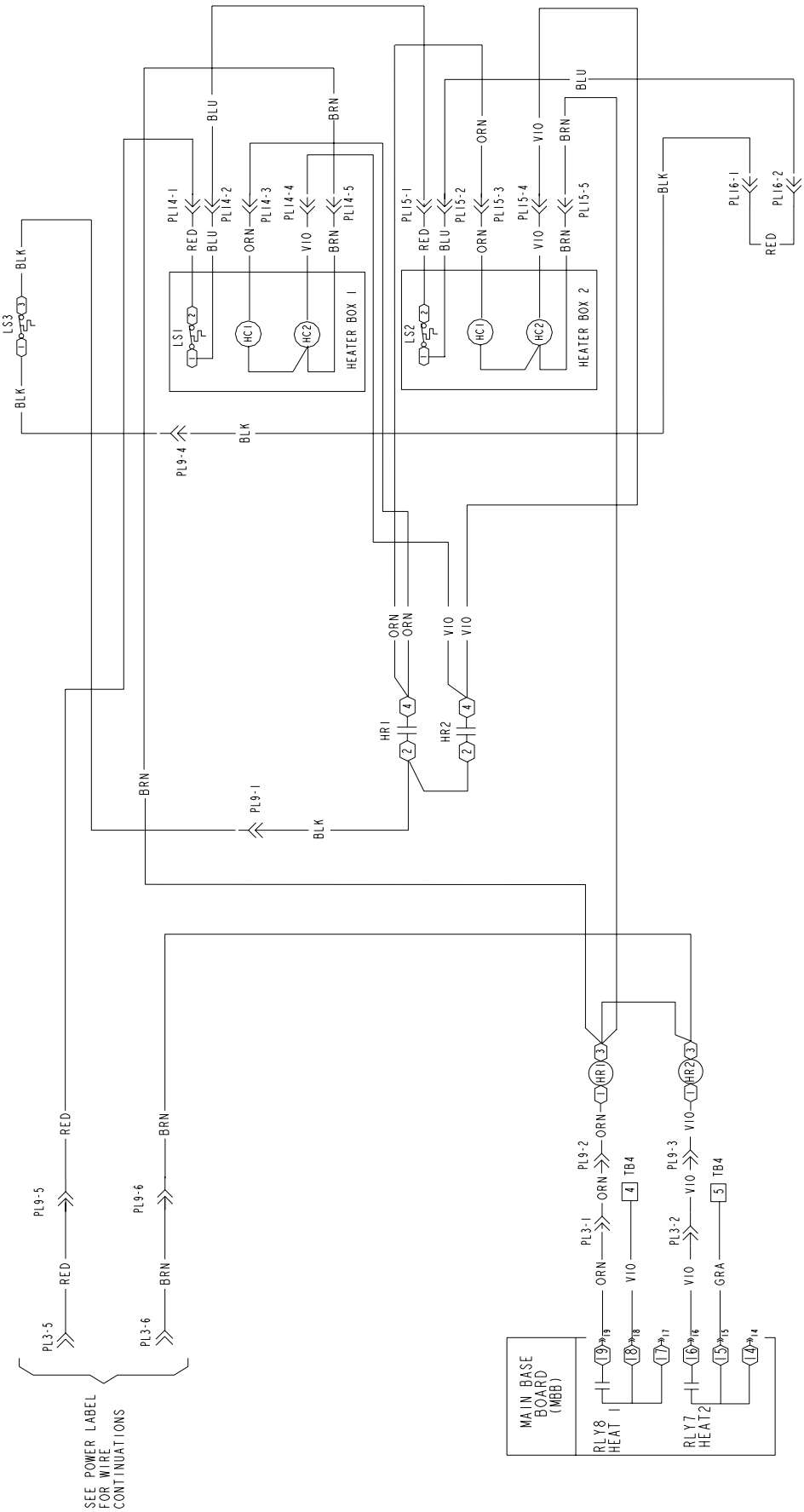


Fig. 17 — Electric Heat Control Circuit — 50AJ,AK,AW,AY020-050 Units

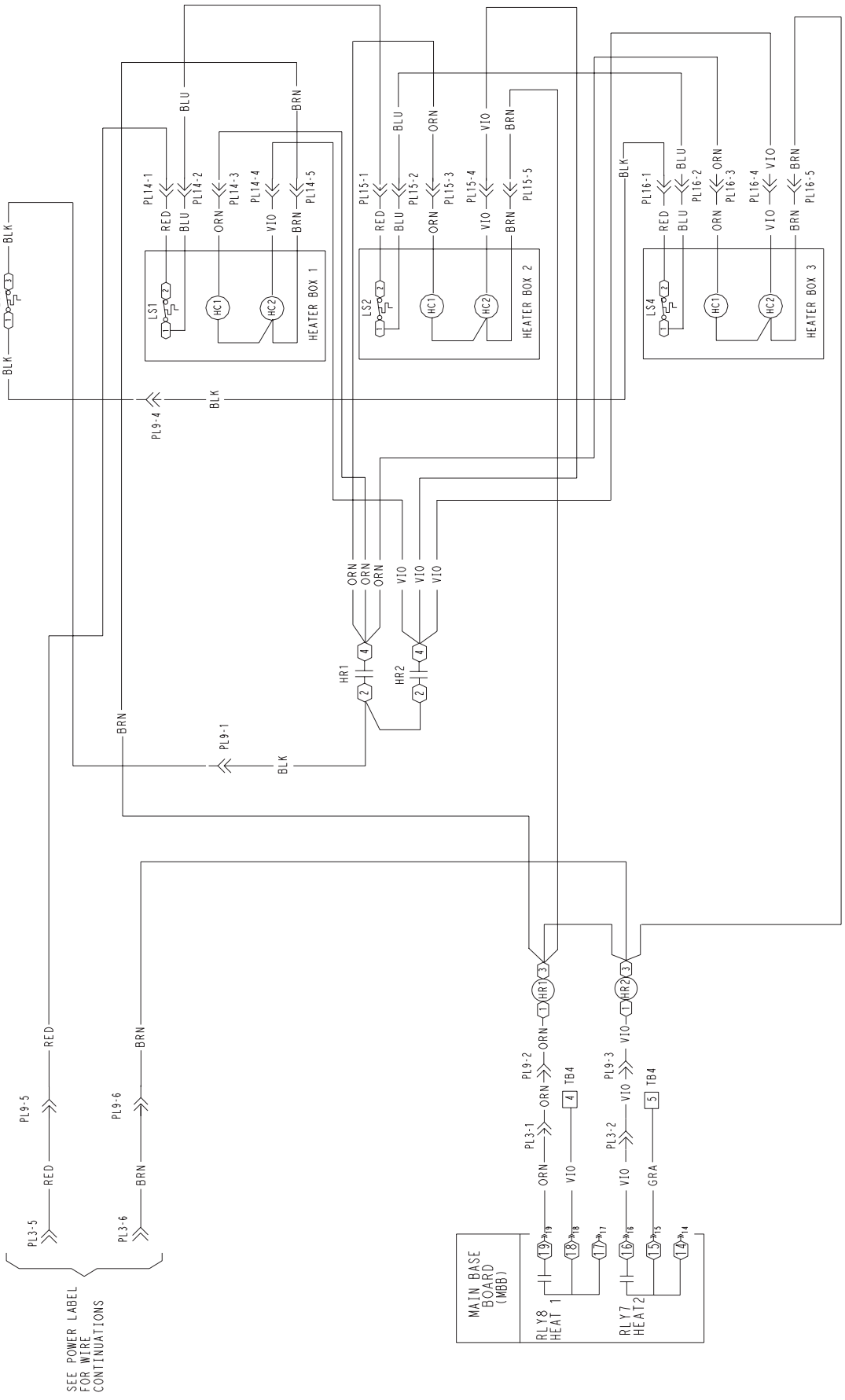
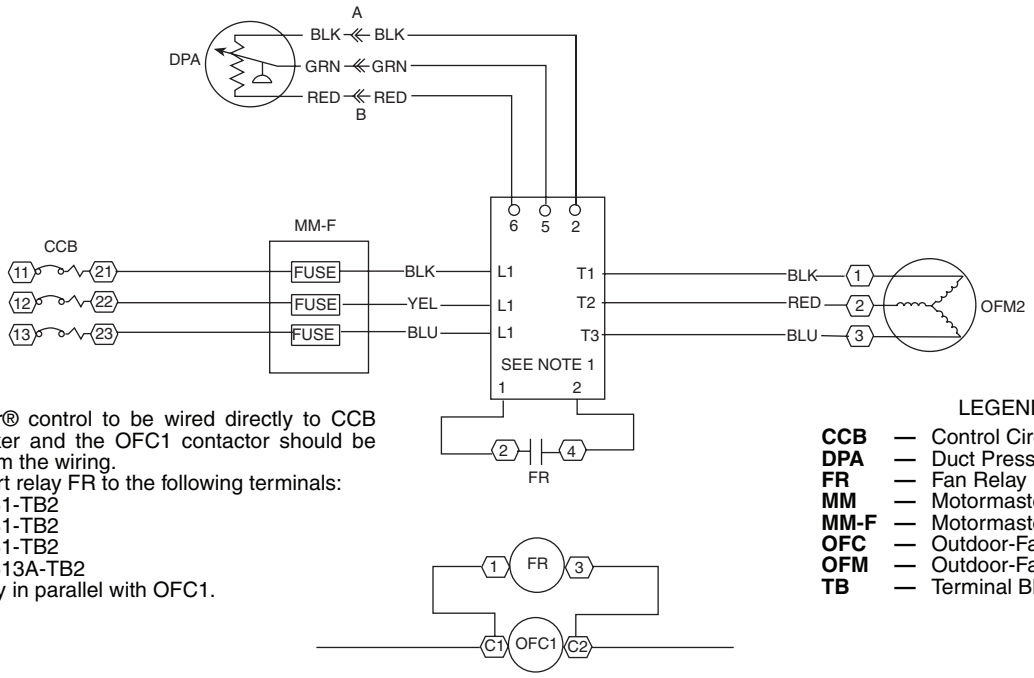


Fig. 18 — Electric Heat Control Circuit — 50AJ,AK,AW,AY051 and 060 Units

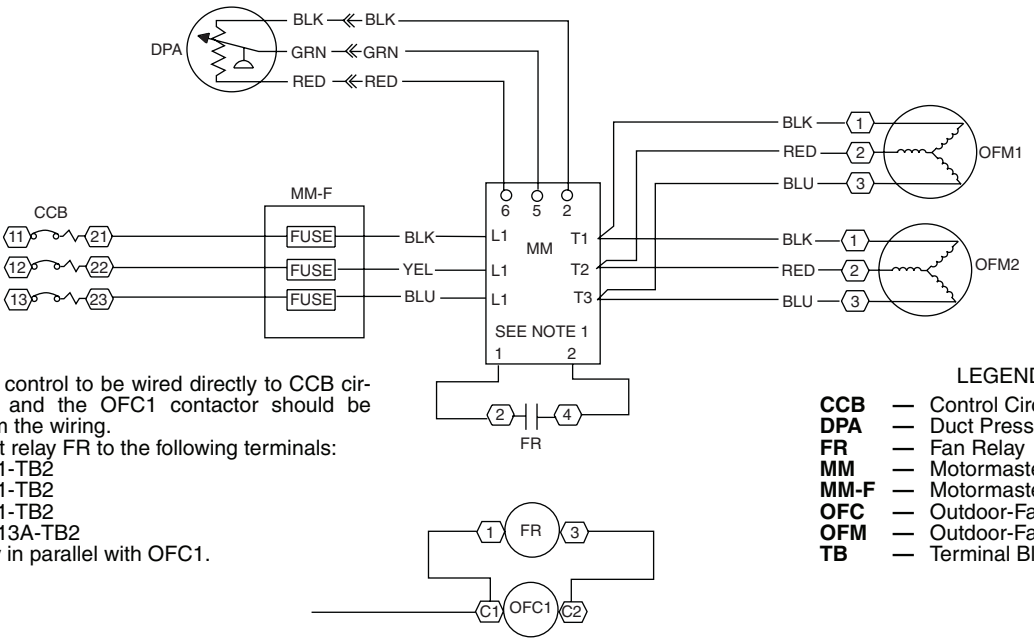


NOTES:
1. Motormaster® control to be wired directly to CCB circuit breaker and the OFC1 contactor should be removed from the wiring.
2. Connect start relay FR to the following terminals:
   230-3-60 TB1-TB2
   460-3-60 TB1-TB2
   575-3-60 TB1-TB2
   208-3-60 TB13A-TB2
3. Add FR relay in parallel with OFC1.

LEGEND

CCB	—	Control Circuit Breaker
DPA	—	Duct Pressure Transducer
FR	—	Fan Relay
MM	—	Motormaster V
MM-F	—	Motormaster V Fuses
OFC	—	Outdoor-Fan Contactor
OFM	—	Outdoor-Fan Motor
TB	—	Terminal Block

Fig. 19 — Motormaster V Accessory Wiring — 48/50AJ,AK,AW,AY020-035 Units

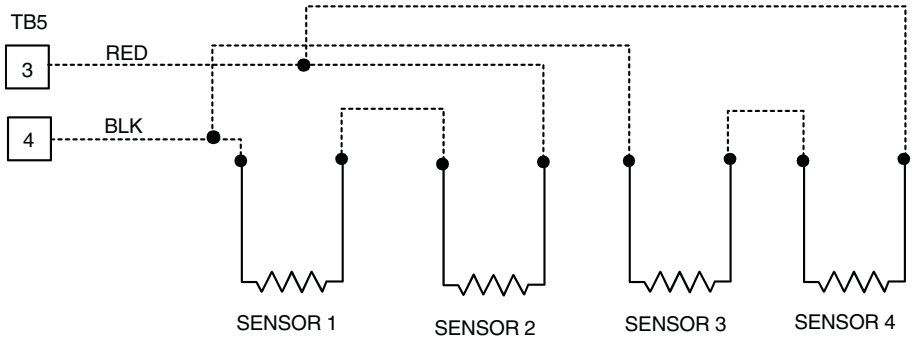


NOTES:
1. Motormaster control to be wired directly to CCB circuit breaker and the OFC1 contactor should be removed from the wiring.
2. Connect start relay FR to the following terminals:
   230-3-60 TB1-TB2
   460-3-60 TB1-TB2
   575-3-60 TB1-TB2
   208-3-60 TB13A-TB2
3. Add FR relay in parallel with OFC1.

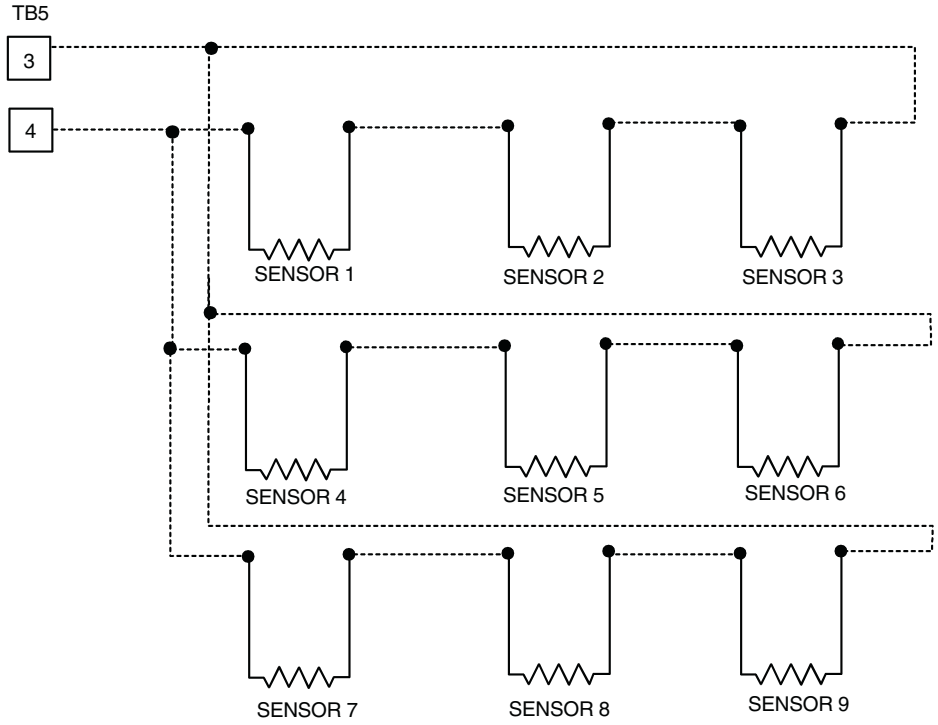
LEGEND

CCB	—	Control Circuit Breaker
DPA	—	Duct Pressure Transducer
FR	—	Fan Relay
MM	—	Motormaster V
MM-F	—	Motormaster V Fuses
OFC	—	Outdoor-Fan Contactor
OFM	—	Outdoor-Fan Motor
TB	—	Terminal Block

Fig. 20 — Motormaster V Accessory Wiring — 48/50AJ,AK,AW,AY036-060 Units

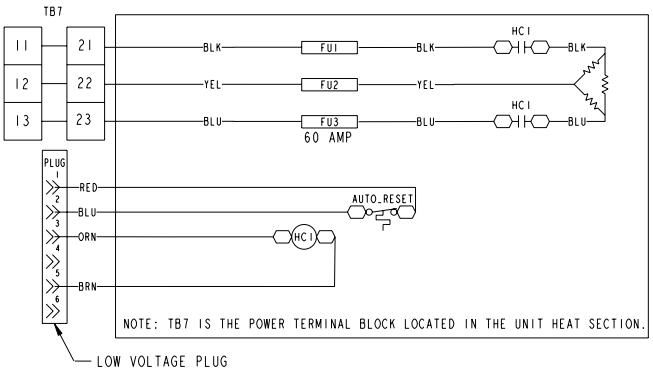


SPACE TEMPERATURE AVERAGING (4 SENSOR APPLICATION)

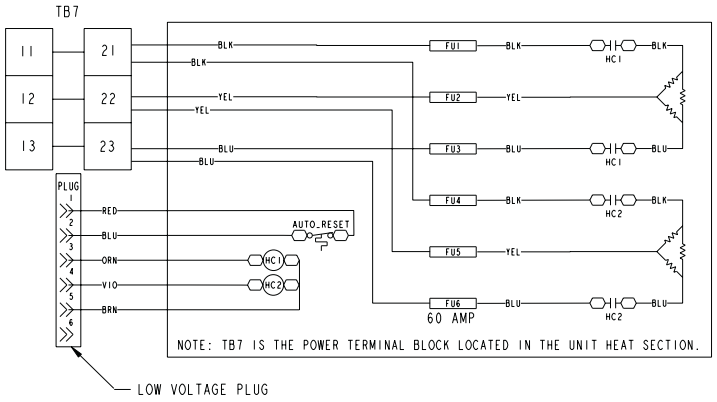


SPACE TEMPERATURE AVERAGING (9 SENSOR APPLICATION)

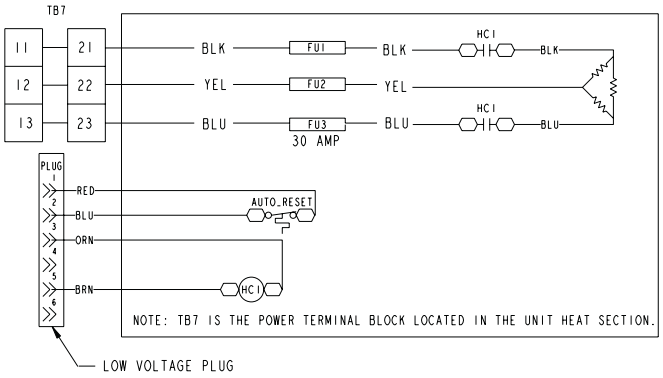
Fig. 21 — Space Temperature Averaging Wiring



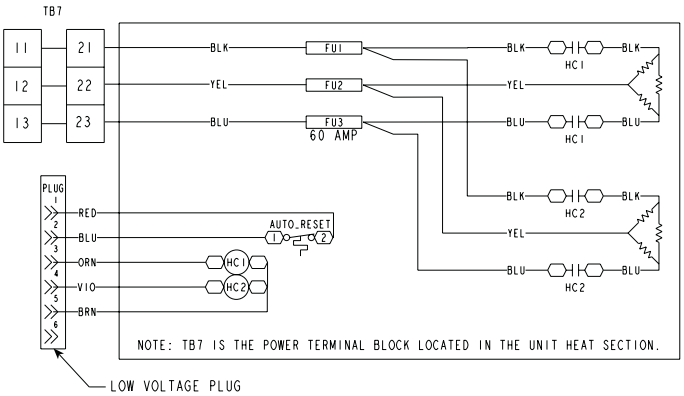
36 kW, 208/230 V, SIZES 020-050
54 kW, 208/230 V, SIZE 051,060



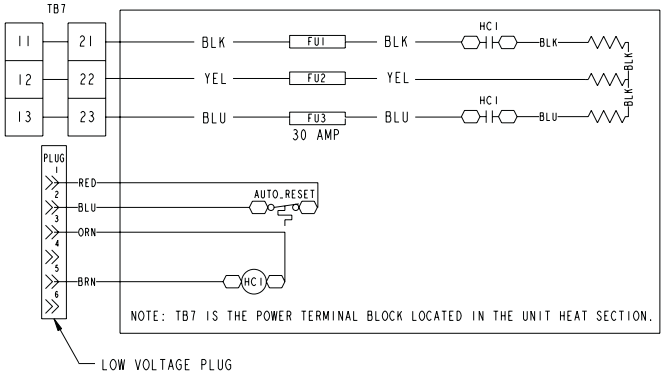
72 kW, 208/230 V, SIZES 020-050
108 kW, 208/230 V, SIZE 051,060



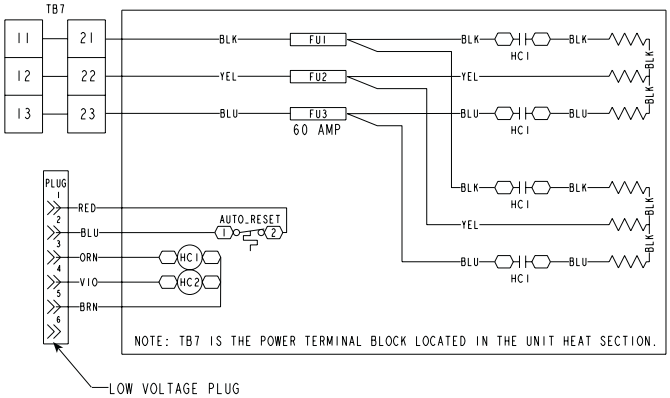
36 kW, 460 V, SIZES 020-050
24 kW, 380 V, SIZES 020-050
27 kW, 400 V, SIZES 020-050
54 kW, 460 V, SIZE 051,060
37 kW, 380 V, SIZE 051,060
41 kW, 400 V, SIZE 051,060



72 kW, 460 V, SIZES 020-050
49 kW, 380 V, SIZES 020-050
54 kW, 400 V, SIZES 020-050
108 kW, 460 V, SIZE 051,060
74 kW, 380 V, SIZE 051,060
82 kW, 400 V, SIZE 051,060



36 kW, 575 V, SIZES 020-050
54 kW, 575 V, SIZE 051,060



72 kW, 575 V, SIZES 020-050
108 kW, 575 V, SIZES 020-050

LEGEND

FU — Fuse
HC — Heater Contactor
TB — Terminal Block

Terminal (Marked)

Terminal Block

Terminal (Unmarked)

Factory Wiring

Fig. 22 — Electric Heater Power Diagrams

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